



# ANALYSIS TO UPDATE ENERGY EFFICIENCY POTENTIAL, GOALS AND TARGETS FOR 2013 AND BEYOND

## APPENDIX VOLUME II DRAFT

### APPENDICES B THROUGH N

Prepared for:  
California Public Utilities Commission



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## Table of Contents

Appendix B – CFL Data Tables .....	3
Appendix C – Behavioral Study Literature Sources .....	8
Appendix D – Commercial Building Type Weighting .....	10
Appendix E – PG&E Measure Level Inputs.....	13
Appendix F – SCE Measure Level Inputs.....	39
Appendix G – SCG Measure Level Inputs .....	58
Appendix H – SDG&E Measure Level Inputs .....	64
Appendix I – Statewide Industrial Measure Level Inputs .....	89
Appendix J – Agricultural Measure Level Inputs .....	96
Appendix K – Emerging Technologies .....	117
Appendix L - Codes and Standards .....	125
Appendix M – EERAM Model Algorithm and Input Details .....	158
Appendix N – EM&V Coordination Matrix.....	179

## Appendix B – CFL Data Tables

This appendix contains utility specific data tables for CFLs, including:

- » Building Type
- » Location
- » Technology Name
- » Average CFL Wattage
- » Density of CFL
- » Equivalent Incandescent Wattage
- » Density of Incandescent
- » Hours of Use
- » Incremental Energy Savings (kWh)
- » Demand Savings (W)

This information was provided by KEMA and is currently the most up to date CFL data available in California.



**Table 1. PG&E CFL Measure Inputs – Provided by KEMA**

Building Type	Location	Navigant Measure Name	CFL Wattage	EE Density	Incandescent Wattage	Incandescent Density	Hours of Use	Energy Savings (kWh)	Energy Savings (W)
SF	Indoor	a) CFL: ≤7W Screw-In	7	0.04	22.00	0.43	1.28707	7.03	18.32
SF	Indoor	b) CFL: 13W Screw-In	13	4.15	54.82	8.63	1.23254	18.45	50.20
SF	Indoor	c) CFL: 18W Screw-In	19	0.94	74.08	1.68	1.27822	25.41	66.68
SF	Indoor	d) CFL: 23W Screw-In	23	2.40	99.85	2.02	1.23204	34.09	92.80
SF	Indoor	e) CFL: >25W Screw-In	27	0.37	175.03	0.16	1.15095	61.45	179.10
SF	Indoor	f) CFL Fixture	17	0.64	72.27	1.86	1.65987	33.33	67.35
SF	Indoor	g) Specialty CFLs	14	2.20	49.79	14.61	1.29239	16.58	43.04
SF	Outdoor	a) CFL: ≤7W Screw-In	7	0.00	20.76	0.09	2.39379	12.02	13.76
SF	Outdoor	b) CFL: 13W Screw-In	13	0.42	55.71	1.07	2.17815	33.67	42.35
SF	Outdoor	c) CFL: 18W Screw-In	19	0.13	74.63	0.18	2.45704	50.18	55.95
SF	Outdoor	d) CFL: 23W Screw-In	23	0.24	99.79	0.26	2.30448	64.48	76.66
SF	Outdoor	e) CFL: >25W Screw-In	27	0.04	197.30	0.01	2.35757	146.54	170.30
SF	Outdoor	f) CFL Fixture	17	0.09	108.09	0.33	3.06304	102.27	91.48
SF	Outdoor	g) Specialty CFLs	19	0.35	66.71	2.05	2.51568	44.19	48.13
MF	Indoor	a) CFL: ≤7W Screw-In	5	0	21.96	0.17	1.34514	8.23	20.53
MF	Indoor	b) CFL: 13W Screw-In	14	1.82	55.31	3.74	1.44348	21.76	50.56
MF	Indoor	c) CFL: 18W Screw-In	19	0.92	74.31	1.07	1.51489	30.21	66.89
MF	Indoor	d) CFL: 23W Screw-In	23	1.08	99.53	0.97	1.62053	44.64	92.40
MF	Indoor	e) CFL: >25W Screw-In	26	0.18	167.43	0.08	1.64139	83.63	170.91
MF	Indoor	f) CFL Fixture	18	0.83	85.06	0.54	1.69757	40.87	80.76
MF	Indoor	g) Specialty CFLs	14	0.63	50.29	4.21	1.40628	18.47	44.05
MF	Outdoor	a) CFL: ≤7W Screw-In	5	-	25.00	0.01	2.96169	21.62	20.00
MF	Outdoor	b) CFL: 13W Screw-In	14	0.12	57.61	0.29	2.49619	40.05	43.95
MF	Outdoor	c) CFL: 18W Screw-In	18	0.08	74.67	0.06	2.75953	56.62	56.22
MF	Outdoor	d) CFL: 23W Screw-In	23	0.09	99.57	0.08	2.34536	65.45	76.45
MF	Outdoor	e) CFL: >25W Screw-In	26	0.02	150.00	0.00	2.03608	92.07	123.89
MF	Outdoor	f) CFL Fixture	15	0.15	119.56	0.01	2.95241	112.18	104.10
MF	Outdoor	g) Specialty CFLs	12	0.02	73.85	0.10	2.95807	66.43	61.53

**Table 2. SCE CFL Measure Inputs – Provided by KEMA**

Building Type	Location	Navigant Measure Name	CFL Wattage	EE Density	Incandescent Wattage	Incandescent Density	Hours of Use	Energy Savings (kWh)	Energy Savings (W)
SF	Indoor	a) CFL: ≤7W Screw-In	7	0.04	22.00	0.43	1.28707	7.47	19.35
SF	Indoor	b) CFL: 13W Screw-In	13	4.15	54.82	8.63	1.23254	19.61	53.01
SF	Indoor	c) CFL: 18W Screw-In	19	0.94	74.08	1.68	1.27822	27.01	70.41
SF	Indoor	d) CFL: 23W Screw-In	23	2.40	99.85	2.02	1.23204	36.23	98.00
SF	Indoor	e) CFL: >25W Screw-In	27	0.37	175.03	0.16	1.15095	65.32	189.13
SF	Indoor	f) CFL Fixture	17	0.64	72.27	1.86	1.65987	35.42	71.12
SF	Indoor	g) Specialty CFLs	14	2.20	49.79	14.61	1.29239	17.62	45.45
SF	Outdoor	a) CFL: ≤7W Screw-In	7	0.00	20.76	0.09	2.39379	12.02	13.76
SF	Outdoor	b) CFL: 13W Screw-In	13	0.42	55.71	1.07	2.17815	33.67	42.35
SF	Outdoor	c) CFL: 18W Screw-In	19	0.13	74.63	0.18	2.45704	50.18	55.95
SF	Outdoor	d) CFL: 23W Screw-In	23	0.24	99.79	0.26	2.30448	64.48	76.66
SF	Outdoor	e) CFL: >25W Screw-In	27	0.04	197.30	0.01	2.35757	146.54	170.30
SF	Outdoor	f) CFL Fixture	17	0.09	108.09	0.33	3.06304	102.27	91.48
SF	Outdoor	g) Specialty CFLs	19	0.35	66.71	2.05	2.51568	44.19	48.13
MF	Indoor	a) CFL: ≤7W Screw-In	5	0	21.96	0.17	1.34514	8.75	21.68
MF	Indoor	b) CFL: 13W Screw-In	14	1.82	55.31	3.74	1.44348	23.13	53.39
MF	Indoor	c) CFL: 18W Screw-In	19	0.92	74.31	1.07	1.51489	32.11	70.64
MF	Indoor	d) CFL: 23W Screw-In	23	1.08	99.53	0.97	1.62053	47.45	97.58
MF	Indoor	e) CFL: >25W Screw-In	26	0.18	167.43	0.08	1.64139	88.89	180.49
MF	Indoor	f) CFL Fixture	18	0.83	85.06	0.54	1.69757	43.44	85.29
MF	Indoor	g) Specialty CFLs	14	0.63	50.29	4.21	1.40628	19.63	46.51
MF	Outdoor	a) CFL: ≤7W Screw-In	5	-	25.00	0.01	2.96169	21.62	20.00
MF	Outdoor	b) CFL: 13W Screw-In	14	0.12	57.61	0.29	2.49619	40.05	43.95
MF	Outdoor	c) CFL: 18W Screw-In	18	0.08	74.67	0.06	2.75953	56.62	56.22
MF	Outdoor	d) CFL: 23W Screw-In	23	0.09	99.57	0.08	2.34536	65.45	76.45
MF	Outdoor	e) CFL: >25W Screw-In	26	0.02	150.00	0.00	2.03608	92.07	123.89
MF	Outdoor	f) CFL Fixture	15	0.15	119.56	0.01	2.95241	112.18	104.10
MF	Outdoor	g) Specialty CFLs	12	0.02	73.85	0.10	2.95807	66.43	61.53

**Table 3. SDG&E CFL Measure Inputs – Provided by KEMA**

Building Type	Location	Navigant Measure Name	CFL Wattage	EE Density	Incandescent Wattage	Incandescent Density	Hours of Use	Energy Savings (kWh)	Energy Savings (W)
SF	Indoor	a) CFL: ≤7W Screw-In	7	0.04	22.00	0.43	1.28707	7.23	18.20
SF	Indoor	b) CFL: 13W Screw-In	13	4.15	54.82	8.63	1.23254	18.97	49.87
SF	Indoor	c) CFL: 18W Screw-In	19	0.94	74.08	1.68	1.27822	26.13	66.23
SF	Indoor	d) CFL: 23W Screw-In	23	2.40	99.85	2.02	1.23204	35.06	92.19
SF	Indoor	e) CFL: >25W Screw-In	27	0.37	175.03	0.16	1.15095	63.20	177.90
SF	Indoor	f) CFL Fixture	17	0.64	72.27	1.86	1.65987	34.27	66.90
SF	Indoor	g) Specialty CFLs	14	2.20	49.79	14.61	1.29239	17.05	42.75
SF	Outdoor	a) CFL: ≤7W Screw-In	7	0.00	20.76	0.09	2.39379	12.02	13.76
SF	Outdoor	b) CFL: 13W Screw-In	13	0.42	55.71	1.07	2.17815	33.67	42.35
SF	Outdoor	c) CFL: 18W Screw-In	19	0.13	74.63	0.18	2.45704	50.18	55.95
SF	Outdoor	d) CFL: 23W Screw-In	23	0.24	99.79	0.26	2.30448	64.48	76.66
SF	Outdoor	e) CFL: >25W Screw-In	27	0.04	197.30	0.01	2.35757	146.54	170.30
SF	Outdoor	f) CFL Fixture	17	0.09	108.09	0.33	3.06304	102.27	91.48
SF	Outdoor	g) Specialty CFLs	19	0.35	66.71	2.05	2.51568	44.19	48.13
MF	Indoor	a) CFL: ≤7W Screw-In	5	0	21.96	0.17	1.34514	8.47	20.39
MF	Indoor	b) CFL: 13W Screw-In	14	1.82	55.31	3.74	1.44348	22.38	50.22
MF	Indoor	c) CFL: 18W Screw-In	19	0.92	74.31	1.07	1.51489	31.07	66.44
MF	Indoor	d) CFL: 23W Screw-In	23	1.08	99.53	0.97	1.62053	45.91	91.79
MF	Indoor	e) CFL: >25W Screw-In	26	0.18	167.43	0.08	1.64139	86.01	169.77
MF	Indoor	f) CFL Fixture	18	0.83	85.06	0.54	1.69757	42.03	80.22
MF	Indoor	g) Specialty CFLs	14	0.63	50.29	4.21	1.40628	18.99	43.75
MF	Outdoor	a) CFL: ≤7W Screw-In	5	-	25.00	0.01	2.96169	21.62	20.00
MF	Outdoor	b) CFL: 13W Screw-In	14	0.12	57.61	0.29	2.49619	40.05	43.95
MF	Outdoor	c) CFL: 18W Screw-In	18	0.08	74.67	0.06	2.75953	56.62	56.22
MF	Outdoor	d) CFL: 23W Screw-In	23	0.09	99.57	0.08	2.34536	65.45	76.45
MF	Outdoor	e) CFL: >25W Screw-In	26	0.02	150.00	0.00	2.03608	92.07	123.89
MF	Outdoor	f) CFL Fixture	15	0.15	119.56	0.01	2.95241	112.18	104.10
MF	Outdoor	g) Specialty CFLs	12	0.02	73.85	0.10	2.95807	66.43	61.53

## Appendix C – Behavioral Study Literature Sources

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## Appendix D – Commercial Building Type Weighting

### Weights by Building Type:

Utility Total Building Stocks	College	Grocery	Hospital	Hotel	Large Office	Misc.	Ref. Warehouse	Restaurant	Retail	School	Small Office	Warehouse	TOTALS
PG&E	5,546	4,329	5,304	4,947	16,361	18,882	1,069	2,305	15,804	9,226	5,404	11,999	101,177
	5.5%	4.3%	5.2%	4.9%	16.2%	18.7%	1.1%	2.3%	15.6%	9.1%	5.3%	11.9%	
SCE	4,529	4,588	4,322	4,227	17,079	19,888	783	3,113	17,164	8,947	5,122	16,379	106,140
	4.3%	4.3%	4.1%	4.0%	16.1%	18.7%	0.7%	2.9%	16.2%	8.4%	4.8%	15.4%	
SDG&E	1,133	1,062	1,299	1,515	3,704	2,947	25	673	3,858	1,886	2,488	2,416	23,006
	4.9%	4.6%	5.6%	6.6%	16.1%	12.8%	0.1%	2.9%	16.8%	8.2%	10.8%	10.5%	
SCG	6,804	5,868	6,093	5,845	26,748	24,913	975	4,115	22,222	11,310	6,745	21,406	143,046
	4.8%	4.1%	4.3%	4.1%	18.7%	17.4%	0.7%	2.9%	15.5%	7.9%	4.7%	15.0%	

### Calculating Weighted Density:

If densities were disaggregated by building type, they would be weighted by building type to come up with one weighted density number. For buildings that did not have a particular measure, the density would be zero. Below are examples of different weighted density cases:

**Case 1: Weighted Density Given:** No additional information required.

Energy Savings	Building Type	Building Weightings
1	Weighted	NA

**Case 2: Density for all building types given:** A total calculated weighted density is needed.

Energy Savings	Building Type	Building Weightings
1 (This is sum-product of individual building densities and their respective building weightings)	Weighted	
1	Small Office	.33
1	Restaurant	.33
1	Retail	.33

**Case 3: Density for only some building types given (as measure does not apply to all building types):** The Navigant team set energy savings to zero for buildings for which we have no density (as measure is not applicable in those buildings). Then a weighted density values was calculated using building weightings.

Energy Savings	Building Type	Building Weightings
0.66 (This is sum-product of individual building densities and their respective building weightings)	Weighted	
1	Small Office	.33
0	Restaurant	.33
1	Retail	.33

### Calculating Weighted Energy Savings:

**Case 1: Weighted Energy Savings Given (From ASSET etc.):** Again, no further action needed

Energy Savings	Building Type	Building Weightings	Building Weightings Revised
100	Weighted	NA	NA

**Case 2: Energy Savings Given for all of the building types:** One weighted energy savings needed.

A new column “Building Weightings Revised” was created to calculate weighted energy savings. Then “Building Weightings Revised” were set equal to “Building Weightings”. “Building Weightings Revised” were then used to calculate weighted energy savings.

Energy Savings	Building Type	Building Weightings	Building Weightings Revised
100 (This is sum-product of individual building densities and their respective revised building weightings)	Weighted	1	1
100	Small Office	.33	.33
100	Restaurant	.33	.33
100	Retail	.33	.33

**Case 3: Energy Savings Given for only one building type:** One weighted energy savings needed.

For this case, weighted energy savings is simply equal to energy savings of the “one” building type provided.

Energy Savings	Building Type	Building Weightings	Building Weightings Revised
100 (This is sum-product of individual building densities and their respective revised building weightings)	Weighted	1	1

0	Small Office	0.33	0
100	Restaurant	0.33	1
0	Retail	0.33	0

**Case 4: Energy Savings Given for only some building types: One weighted energy savings needed.**

For this case, the “Building Weightings Revised” column was recalculated; it was revised such that the “Building Weightings Revised” for buildings where the measure is NA was zero, but the sum of all “Building Weightings Revised” is still equal to 1. The example should make this clear.

Energy Savings	Building Type	Building Weightings	Building Weightings Revised
105 (This is sum-product of individual building densities and their respective revised building weightings)	Weighted	1	1
100	Small Office	0.33	0.5
0	Restaurant	0.33	0
110	Retail	0.33	0.5

## Appendix E – PG&E Measure Level Inputs

**Table E-1: PG&E Residential - Electric Savings Measure Inputs**

PG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Recycle refrigerator	Appliance	Appliance	SFE	1200.12	600.33	0.0387	0.1430	0.61
Recycle freezer	Appliance	Appliance	SFE	676.81	625.07	0.2052	0.1427	0.61
ES Refrigerator	Appliance	Appliance	SFE	74.11	225.12	0.1866	0.1259	0.75
ES Dishwasher	Appliance	Appliance	SFE	63.60	73.71	0.0436	0.0410	0.80
ES Freezer	Appliance	Appliance	SFE	55.05	161.29	0.1835	0.1258	0.75
High Efficiency Pool Pump	Appliance	Pump	SFE	967.00	967.00	0.1406	0.1406	0.69
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	137.62	484.14	0.0000	0.2839	0.27
High perf window	Building Envelope	Home	SFE	180.73	180.73	0.0000	0.2839	0.55
ES Room AC	HVAC	Appliance	SFE	15.90	15.90	0.4001	0.4001	0.80
HVAC Controls	HVAC	Control	SFE	105.56	105.56	0.0000	0.0000	0.49
Residential Night Ventilation Cooling	HVAC	Per Home	SFE	172.17	172.17	0.0000	0.0000	0.80
Rooftop or split system SEER 15	HVAC	Home	SFE	147.15	197.12	1.4449	0.9239	0.80
Rooftop or split system SEER 18	HVAC	Home	SFE	192.00	276.05	1.0680	0.8765	0.80
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	SFE	126.02	126.02	1.9601	1.9601	0.80
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	SFE	414.81	414.81	3.0331	3.0331	0.80
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	SFE	619.34	619.34	1.6363	1.6363	0.80
Residential HVAC for Hot-Dry Climates	HVAC	Per Home	SFE	42.01	42.01	4.2852	4.2852	0.80
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	SFE	69.52	69.52	5.4042	5.4042	0.80
HVAC Quality Maintenance	HVAC	Per Home	SFE	203.50	200.00	1.8530	0.5772	0.85
CFL: ≤7W Screw-In Indoor	Indoor Lighting	Lamp	SFE	11.93	7.03	0.1425	0.1486	0.60
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	SFE	11.93	7.03	0.1425	0.1486	0.80
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	SFE	22.17	18.45	0.1425	0.1421	0.60

PG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	SFE	22.17	18.45	0.1425	0.1421	0.80
CFL Fixture	Indoor Lighting	Fixture	SFE	39.19	33.33	0.1378	0.1620	0.73
Super T-8	Indoor Lighting	Lamp	SFE	13.28	13.28	0.0753	0.0753	0.73
Specialty CFLs	Indoor Lighting	Lamp	SFE	16.58	16.58	0.1378	0.1620	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	SFE	30.65	25.41	0.1403	0.1496	0.60
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	SFE	30.65	25.41	0.1403	0.1496	0.80
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	SFE	39.19	34.09	0.1378	0.1552	0.60
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	SFE	39.19	34.09	0.1378	0.1552	0.80
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	SFE	51.12	61.45	0.1389	0.1661	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	SFE	51.12	61.45	0.1389	0.1661	0.80
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	SFE	12.00	12.00	0.0095	0.0095	0.85
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	SFE	21.00	21.00	0.0081	0.0081	0.85
LED: PAR 20	Indoor Lighting	Lamp	SFE	22.00	22.00	0.0078	0.0078	0.85
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	SFE	32.00	32.00	0.0089	0.0089	0.85
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	SFE	37.00	37.00	0.0077	0.0077	0.85
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	SFE	39.00	39.00	0.0088	0.0088	0.85
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	SFE	46.00	46.00	0.0087	0.0087	0.85
LED: Recessed Fixtures	Indoor Lighting	Lamp	SFE	125.00	125.00	0.0087	0.0087	0.85
ES Clothes Washer	Laundry	Appliance	SFE	309.50	309.50	0.1046	0.0848	0.85
Other	Other	Home	SFE	16165.00	6156.00	0.1600	0.1600	1.00
CFL: 7W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	15.75	26.84	0.0000	0.0000	0.60
LED Lighting 40W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	15.75	26.84	0.0000	0.0000	0.80
CFL: 13W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	29.26	49.85	0.0000	0.0000	0.60
LED Lighting 60W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	29.26	49.85	0.0000	0.0000	0.80
CFL: 18W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	40.46	69.02	0.0000	0.0000	0.60

PG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL: 23W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	51.73	88.19	0.0000	0.0000	0.60
CFL: >25W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	67.48	115.03	0.0000	0.0000	0.85
CFL Fixture - Outdoor	Outdoor Lighting	Fixture	SFE	59.26	102.27	0.0000	0.0000	0.73
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	SFE	19.30	19.30	0.0000	0.0000	0.73
Efficient Set Top Box	Plug Loads	Box	SFE	149.00	149.00	0.0000	0.0000	0.80
ES LCD/Plasma TVs	Plug Loads	TV	SFE	46.60	46.60	0.4554	0.4554	0.80
Efficient Game Console	Plug Loads	Device	SFE	31.50	31.50	0.0000	0.0000	0.80
Other Water Heating	Water Heating	Home	SFE	93.30	1.00	0.0216	0.0216	0.80
Heat Pump Water Heaters	Water Heating	Per Home	SFE	1642.93	1642.93	0.1500	0.1500	0.80
Recycle refrigerator	Appliance	Appliance	MFE	1200.12	600.33	0.0387	0.1430	0.61
Recycle freezer	Appliance	Appliance	MFE	676.81	625.07	0.2052	0.1427	0.61
ES Refrigerator	Appliance	Appliance	MFE	79.80	250.00	0.1690	0.1177	0.75
ES Dishwasher	Appliance	Appliance	MFE	46.35	53.37	0.0414	0.0379	0.80
ES Freezer	Appliance	Appliance	MFE	60.48	180.22	0.1612	0.1177	0.75
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	41.97	58.32	0.0000	0.9732	0.27
High perf window	Building Envelope	Home	MFE	61.10	61.10	0.0000	0.0000	0.55
ES Room AC	HVAC	Appliance	MFE	5.43	5.43	0.9165	0.9165	0.80
HVAC Controls	HVAC	Control	MFE	50.68	50.68	0.0000	0.0000	0.49
Rooftop or split system SEER 15	HVAC	Home	MFE	68.32	91.52	1.0570	0.6759	0.80
Rooftop or split system SEER 18	HVAC	Home	MFE	108.16	155.51	0.8480	0.6960	0.80
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	MFE	48.06	48.06	3.2872	3.2872	0.80
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	MFE	190.50	190.50	1.7906	1.7906	0.80
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	MFE	227.20	227.20	1.2964	1.2964	0.80
Residential HVAC for Hot-Dry Climates	HVAC	Per Unit	MFE	16.02	16.02	7.1867	7.1867	0.80
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	MFE	26.51	26.51	9.0634	9.0634	0.80
HVAC Quality Maintenance	HVAC	Per Home	MFE	64.98	63.86	1.9850	0.6183	0.85

PG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL: ≤7W Screw-In Indoor	Indoor Lighting	Lamp	MFE	11.93	8.23	0.1425	0.1421	0.60
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	MFE	11.93	8.23	0.1425	0.1421	0.80
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	MFE	22.17	21.76	0.1399	0.1325	0.60
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	MFE	22.17	21.76	0.1399	0.1325	0.80
CFL Fixture	Indoor Lighting	Fixture	MFE	39.19	40.87	0.1378	0.1321	0.73
Super T-8	Indoor Lighting	Lamp	MFE	24.59	24.59	0.1010	0.1010	0.73
Specialty CFLs	Indoor Lighting	Lamp	MFE	18.47	18.47	0.1378	0.1321	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	MFE	30.65	38.96	0.1403	0.1262	0.60
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	MFE	30.65	38.96	0.1403	0.1262	0.80
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	MFE	39.19	44.64	0.1378	0.1180	0.60
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	MFE	39.19	44.64	0.1378	0.1180	0.80
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	MFE	51.12	83.63	0.1389	0.1165	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	MFE	51.12	83.63	0.1389	0.1165	0.80
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	MFE	12.00	12.00	0.0095	0.0095	0.85
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	MFE	21.00	21.00	0.0081	0.0081	0.85
LED: PAR 20	Indoor Lighting	Lamp	MFE	22.00	22.00	0.0078	0.0078	0.85
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	MFE	32.00	32.00	0.0089	0.0089	0.85
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	MFE	37.00	37.00	0.0077	0.0077	0.85
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	MFE	39.00	39.00	0.0088	0.0088	0.85
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	MFE	46.00	46.00	0.0087	0.0087	0.85
LED: Recessed Fixtures	Indoor Lighting	Lamp	MFE	125.00	125.00	0.0087	0.0087	0.85
ES Clothes Washer	Laundry	Appliance	MFE	283.18	283.18	0.1074	0.0843	0.85
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	MFE	19.30	19.30	0.0000	0.0000	0.73
Efficient Set Top Box	Plug Loads	Box	MFE	149.00	149.00	0.0000	0.0000	0.80
ES LCD/Plasma TVs	Plug Loads	TV	MFE	46.60	46.60	0.4554	0.4554	0.80
Efficient Game Console	Plug Loads	Device	MFE	31.50	31.50	0.0000	0.0000	0.80



PG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Heat Pump Water Heaters	Water Heating	Per Home	MFE	624.10	624.10	0.1500	0.1500	0.80
Low Income	Low Income	Home	LI	391.00	391.00	0.2421	0.2421	1.00
WB - NC - 15%	Whole building	Home	RNC	698.00	698.00	0.3100	0.3100	0.80
WB - NC - 25%	Whole building	Home	RNC	1602.00	1602.00	0.8900	0.8900	0.80
WB - NC - 30%	Whole building	Home	RNC	1775.00	1775.00	0.9300	0.9300	0.80

**Table E-2: PG&E Residential Electric - Density and Cost Measure Inputs**

PG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Recycle refrigerator	Appliance	Appliance	SFE	HIM	0.380	0.000	0.380	5	\$92.20
Recycle freezer	Appliance	Appliance	SFE	HIM	0.010	0.000	0.010	4	\$92.20
ES Refrigerator	Appliance	Appliance	SFE	HIM	0.839	0.161	1.000	14	\$123.02
ES Dishwasher	Appliance	Appliance	SFE	Secondary	0.074	0.001	0.074	11	\$220.00
ES Freezer	Appliance	Appliance	SFE	Secondary	0.252	0.000	0.252	11	\$35.00
High Efficiency Pool Pump	Appliance	Pump	SFE	HIM	0.137	0.007	0.144	10	\$600.00
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	Secondary	0.179	0.261	0.440	20	\$131.43
High perf window	Building Envelope	Home	SFE	Secondary	0.117	0.323	0.440	20	\$2,383.32
ES Room AC	HVAC	Appliance	SFE	Secondary	0.092	0.010	0.102	9	\$41.58
HVAC Controls	HVAC	Control	SFE	MOI	0.439	0.001	0.440	12	\$118.69
Residential Night Ventilation Cooling	HVAC	Per Home	SFE	ET	0.150	0.000	0.150	10	\$1,000.00
Rooftop or split system SEER 15	HVAC	Home	SFE	MOI	0.439	0.001	0.440	15	\$714.00
Rooftop or split system SEER 18	HVAC	Home	SFE	MOI	0.439	0.001	0.440	15	\$1,788.00
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	SFE	ET	0.084	0.000	0.084	15	\$1,025.00
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	SFE	ET	0.389	0.050	0.439	15	\$1,814.50
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	SFE	ET	0.439	0.000	0.439	15	\$3,346.85
Residential HVAC for Hot-Dry Climates	HVAC	Per Home	SFE	ET	0.389	0.000	0.389	15	\$746.00
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	SFE	ET	0.335	0.000	0.335	15	\$3,142.00
HVAC Quality Maintenance	HVAC	Per Home	SFE	ET	0.651	0.302	0.953	8	\$1,152.17
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	0.430	0.038	0.468	6.5	\$4.14
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	0.430	0.038	0.468	20	\$58.55
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	8.632	4.150	12.783	6.5	\$4.79
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	8.632	4.150	12.783	20	\$58.55
CFL Fixture	Indoor Lighting	Fixture	SFE	HIM	1.855	0.636	2.492	16	\$53.41

PG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Super T-8	Indoor Lighting	Lamp	SFE	MOI	3.450	0.000	3.450	5	\$2.79
Specialty CFLs	Indoor Lighting	Lamp	SFE	HIM	14.613	2.197	16.810	5.3	\$7.16
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	1.683	0.936	2.618	6.5	\$5.37
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	1.683	0.936	2.618	20	\$32.63
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	2.022	2.399	4.421	6.5	\$5.95
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	2.022	2.399	4.421	20	\$42.70
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	0.156	0.367	0.523	6.5	\$7.52
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	0.156	0.367	0.523	20	\$50.76
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	SFE	ET	0.050	0.005	0.055	20	\$44.00
ES Clothes Washer	Laundry	Appliance	SFE	HIM	0.071	0.025	0.096	12	\$105.33
Other	Other	Home	SFE	Secondary	0.002	0.000	0.002	20	\$1,000.00
CFL: 7W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.091	0.001	0.092	5.3	\$12.06
LED Lighting 40W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	ET	0.091	0.001	0.092	20	\$58.55
CFL: 13W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	1.068	0.422	1.490	5.3	\$13.43
LED Lighting 60W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	ET	1.068	0.422	1.490	20	\$58.55
CFL: 18W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.177	0.126	0.303	5.3	\$14.60
CFL: 23W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.257	0.236	0.494	5.3	\$15.77
CFL: >25W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.009	0.043	0.052	5.3	\$16.95

PG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
CFL Fixture - Outdoor	Outdoor Lighting	Fixture	SFE	HIM	0.325	0.094	0.419	16	\$45.52
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	SFE	HIM	2.567	0.066	2.633	5	\$14.41
Efficient Set Top Box	Plug Loads	Box	SFE	MOI	1.167	0.000	1.167	5	\$19.02
ES LCD/Plasma TVs	Plug Loads	TV	SFE	MOI	0.719	0.000	0.719	5	\$85.99
Efficient Game Console	Plug Loads	Device	SFE	MOI	0.422	0.000	0.422	5	\$228.59
Other Water Heating	Water Heating	Home	SFE	Secondary	0.042	0.000	0.042	20	\$400.00
Heat Pump Water Heaters	Water Heating	Per Home	SFE	ET	0.050	0.000	0.050	10	\$1,100.00
Recycle refrigerator	Appliance	Appliance	MFE	HIM	0.100	0.000	0.100	5	\$92.20
Recycle freezer	Appliance	Appliance	MFE	HIM	0.002	0.000	0.002	4	\$92.20
ES Refrigerator	Appliance	Appliance	MFE	HIM	0.872	0.128	1.000	14	\$123.02
ES Dishwasher	Appliance	Appliance	MFE	Secondary	0.101	0.001	0.102	11	\$220.00
ES Freezer	Appliance	Appliance	MFE	Secondary	0.116	0.000	0.116	11	\$35.00
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	Secondary	0.193	0.247	0.440	20	\$49.81
High perf window	Building Envelope	Home	MFE	Secondary	0.000	0.000	0.000	20	\$1,319.73
ES Room AC	HVAC	Appliance	MFE	Secondary	0.104	0.012	0.115	9	\$41.58
HVAC Controls	HVAC	Control	MFE	MOI	0.439	0.001	0.440	12	\$118.69
Rooftop or split system SEER 15	HVAC	Home	MFE	MOI	0.439	0.001	0.440	15	\$395.37
Rooftop or split system SEER 18	HVAC	Home	MFE	MOI	0.439	0.001	0.440	15	\$990.08
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	MFE	ET	0.389	0.000	0.389	15	\$1,025.00
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	MFE	ET	0.389	0.050	0.439	15	\$695.44
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	MFE	ET	0.439	0.000	0.439	15	\$3,377.91
Residential HVAC for Hot-Dry Climates	HVAC	Per Unit	MFE	ET	0.389	0.000	0.389	15	\$746.00
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	MFE	ET	0.335	0.000	0.335	15	\$3,142.00
HVAC Quality Maintenance	HVAC	Per Home	MFE	ET	0.666	0.293	0.959	8	\$1,152.17
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.168	0.000	0.168	6.5	\$4.14

PG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.168	0.000	0.168	20	\$58.55
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	3.737	1.820	5.557	6.5	\$4.79
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	3.737	1.820	5.557	20	\$58.55
CFL Fixture	Indoor Lighting	Fixture	MFE	HIM	0.537	0.832	1.370	16	\$53.41
Super T-8	Indoor Lighting	Lamp	MFE	MOI	2.908	0.000	2.908	5	\$2.79
Specialty CFLs	Indoor Lighting	Lamp	MFE	HIM	4.210	0.634	4.844	5.3	\$7.16
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	1.071	0.915	1.987	6.5	\$5.37
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	1.071	0.915	1.987	20	\$32.63
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.966	1.079	2.045	6.5	\$5.95
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.966	1.079	2.045	20	\$42.70
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.084	0.176	0.260	6.5	\$7.52
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.084	0.176	0.260	20	\$50.76
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	MFE	ET	0.050	0.005	0.055	20	\$44.00
ES Clothes Washer	Laundry	Appliance	MFE	HIM	0.118	0.032	0.149	12	\$105.33
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	MFE	HIM	1.755	0.045	1.800	5	\$14.41
Efficient Set Top Box	Plug Loads	Box	MFE	MOI	0.750	0.000	0.750	5	\$19.02
ES LCD/Plasma TVs	Plug Loads	TV	MFE	MOI	0.370	0.000	0.370	5	\$85.99
Efficient Game Console	Plug Loads	Device	MFE	MOI	0.320	0.000	0.320	5	\$228.59

PG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Heat Pump Water Heaters	Water Heating	Per Home	MFE	ET	0.160	0.000	0.160	10	\$1,100.00
Low Income	Low Income	Home	LI	Low Income	1.000	0.000	1.000	10	\$678.00
WB - NC - 15%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$300.00
WB - NC - 25%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$3,220.00
WB - NC - 30%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$5,414.00

**Table E-3: PG&E Residential Gas Savings Measure Inputs**

PG&E Residential Gas - Savings Measure Inputs						
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
ES Dishwasher	Appliance	Appliance	SFE	4.17	4.17	0.8
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	86.80	112.54	0.7
High perf window	Building Envelope	Home	SFE	34.01	34.01	0.6
High Efficiency Furnace	HVAC	Furnace	SFE	36.37	36.37	0.6
Duct sealing and insul	HVAC	Home	SFE	12.89	12.89	0.8
High Efficiency Space heating boiler	HVAC	Boiler	SFE	1024.72	1024.72	0.6
ES Clothes Washer	Laundry	Appliance	SFE	11.19	11.19	0.9
Other	Other	Home	SFE	0.09	0.09	1.0
Water heater controls on Boilers	Water Heating	Control	SFE	39.50	10.67	0.6
Low Flow Showerhead	Water Heating	Home	SFE	11.20	11.20	0.9
Faucet Aerator	Water Heating	Home	SFE	6.33	6.33	0.9
High Efficiency Pool Heater	Water Heating	Pool	SFE	47.81	47.81	0.8
High Efficiency Water heating boiler	Water Heating	Boiler	SFE	73.00	73.00	0.8
High Efficiency Water Heater	Water Heating	Unit	SFE	36.07	33.93	0.6
Condensing Gas Water Heater	Water Heating	Unit	SFE	54.00	54.00	1.0
ES Dishwasher	Appliance	Appliance	MFE	2.96	2.96	0.8
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	71.87	91.07	0.7
High perf window	Building Envelope	Home	MFE	18.83	18.83	0.6
High Efficiency Furnace	HVAC	Furnace	MFE	15.76	15.76	0.6
Duct sealing and insul	HVAC	Home	MFE	1.69	1.69	0.8
High Efficiency Space heating boiler	HVAC	Boiler	MFE	1024.72	1024.72	0.6
ES Clothes Washer	Laundry	Appliance	MFE	10.39	10.39	0.9
Water heater controls on Boilers	Water Heating	Control	MFE	39.50	10.67	0.6
Low Flow Showerhead	Water Heating	Home	MFE	21.00	21.00	0.9
Faucet Aerator	Water Heating	Home	MFE	6.33	6.33	0.9
High Efficiency Water heating boiler	Water Heating	Boiler	MFE	73.00	73.00	0.8
High Efficiency Water Heater	Water Heating	Unit	MFE	32.82	30.75	0.6
Condensing Gas Water Heater	Water Heating	Unit	MFE	51.00	51.00	1.0
Low Income	Low Income	Home	LI	20.00	20.00	1.0
WB - NC - 15%	Whole building	Home	RNC	77.63	77.63	0.8
WB - NC - 25%	Whole building	Home	RNC	150.70	150.70	0.8

PG&E Residential Gas - Savings Measure Inputs						
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
WB - NC - 30%	Whole building	Home	RNC	199.47	199.47	0.8

**Table C-4: PG&E Residential Gas - Density and Cost Measure Inputs**

PG&E Residential Gas - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Category	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
ES Dishwasher	Appliance	Appliance	SFE	Appliance	0.600	0.002	0.603	5	\$211.47
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	Home	0.315	0.460	0.775	20	\$1,770.96
High perf window	Building Envelope	Home	SFE	Home	0.207	0.568	0.775	20	\$2,383.32
High Efficiency Furnace	HVAC	Furnace	SFE	Furnace	0.771	0.004	0.775	10	\$463.51
Duct sealing and insul	HVAC	Home	SFE	Home	0.605	0.170	0.775	9	\$1,770.96
High Efficiency Space heating boiler	HVAC	Boiler	SFE	Boiler	0.000	0.000	0.000	20	\$297.85
ES Clothes Washer	Laundry	Appliance	SFE	Appliance	0.580	0.201	0.781	12	\$475.18
Other	Other	Home	SFE	Home	1.000	0.000	1.000	20	\$0.90
Water heater controls on Boilers	Water Heating	Control	SFE	Control	0.000	0.000	0.000	10	\$36.89
Low Flow Showerhead	Water Heating	Home	SFE	Home	0.189	0.598	0.787	10	\$31.65
Faucet Aerator	Water Heating	Home	SFE	Home	0.357	0.430	0.787	10	\$9.50
High Efficiency Pool Heater	Water Heating	Pool	SFE	Pool	0.035	0.000	0.035	10	\$794.00
High Efficiency Water heating boiler	Water Heating	Boiler	SFE	Boiler	0.000	0.000	0.000	20	\$297.85
High Efficiency Water Heater	Water Heating	Unit	SFE	Unit	0.724	0.063	0.787	11	\$142.90
Condensing Gas Water Heater	Water Heating	Unit	SFE	Unit	0.724	0.063	0.787	15	\$1,039.50
ES Dishwasher	Appliance	Appliance	MFE	HIM	0.487	0.001	0.489	5	\$105.73
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	HIM	0.275	0.351	0.626	20	\$501.73
High perf window	Building Envelope	Home	MFE	Secondary	0.321	0.305	0.626	20	\$659.87
High Efficiency Furnace	HVAC	Furnace	MFE	HIM	0.623	0.003	0.626	10	\$231.75
Duct sealing and insul	HVAC	Home	MFE	HIM	0.503	0.123	0.626	9	\$501.73
High Efficiency Space heating boiler	HVAC	Boiler	MFE	HIM	0.026	0.001	0.026	20	\$148.93
ES Clothes Washer	Laundry	Appliance	MFE	HIM	0.565	0.151	0.716	12	\$237.59
Water heater controls on Boilers	Water Heating	Control	MFE	HIM	0.018	0.008	0.026	10	\$18.44
Low Flow Showerhead	Water Heating	Home	MFE	HIM	0.218	0.520	0.738	10	\$15.82



PG&E Residential Gas - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Category	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Faucet Aerator	Water Heating	Home	MFE	HIM	0.363	0.375	0.738	10	\$4.75
High Efficiency Water heating boiler	Water Heating	Boiler	MFE	HIM	0.009	0.001	0.010	20	\$148.93
High Efficiency Water Heater	Water Heating	Unit	MFE	HIM	0.674	0.064	0.738	11	\$71.45
Condensing Gas Water Heater	Water Heating	Unit	MFE	ET	0.674	0.064	0.738	15	\$519.75
Low Income	Low Income	Home	LI	Low Income	1.000	0.000	1.000	10	\$380.00
WB - NC - 15%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$300.00
WB - NC - 25%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$1,985.00
WB - NC - 30%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$2,971.00

**Table E-5: PG&E Commercial Electric - Savings Measure Inputs**

PG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Window film	Building Envelope	Sq. Ft.	4.46	4.46	1.9263	1.9263	0.85
Cool Roof	Building Envelope	Sq. Ft.	0.11	0.11	0.0000	0.0000	0.7
PS Exterior HID - Incandescent Base > 150W	Exterior Lighting	Fixture	285.51	285.51	0.0563	0.0563	0.77
PS Exterior HID - Incandescent Base <= 150W	Exterior Lighting	Fixture	519.60	519.60	0.0589	0.0589	0.77
PS Exterior HID - Mercury Vapor Base	Exterior Lighting	Fixture	357.10	357.10	0.0485	0.0485	0.77
Lighting Controls - Photocell	Exterior Lighting	Photocell	262.80	262.80	0.0016	0.0016	0.81
Lighting Controls - Timedclock	Exterior Lighting	Timedclock	262.80	262.80	0.0016	0.0016	0.81
LED Outdoor Street/Area Lighting	Exterior Lighting	Fixture	633.00	633.00	0.0445	0.0445	0.85
Convection Oven	Food Service	Oven	1315.00	1315.00	0.3270	0.3270	0.7
HE Fryer	Food Service	Fryer	816.00	816.00	0.2206	0.2206	0.7
Refrigerator Glass Doors	Food Service	Refrigerator	1622.00	1622.00	0.1201	0.1201	0.7
HE Griddle	Food Service	Griddle	1886.00	1886.00	0.2121	0.2121	0.7
Food Holding Cabinet	Food Service	Holding Cab	9307.50	9307.50	0.1826	0.1826	0.7
HE Ice Maker	Food Service	Ice Maker	1197.10	1197.10	0.2740	0.2740	0.7
Combination Oven	Food Service	Oven	18431.00	18431.00	0.2051	0.2051	0.7
Solid Door Reach-in Freezer	Food Service	Freezer	1201.00	1201.00	0.1203	0.1203	0.7
Solid Door Reach-in Refrigerator	Food Service	Refrigerator	650.00	650.00	0.1203	0.1203	0.7
Pressureless Steamer	Food Service	Steamer	11070.00	11070.00	0.1925	0.1925	0.7
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	HVAC	Tons	147.75	147.75	0.0002	0.0002	0.5
High Performance Rooftop Unit	HVAC	Tons	1320.00	1320.00	0.2038	0.2038	0.7
Retro commissioning	HVAC	HP	408.18	408.18	1.2728	1.2728	0.7
High Efficiency Centrifugal Chiller	HVAC	Tons	148.96	148.96	0.4824	0.4824	0.64
High Efficiency Reciprocating Chiller	HVAC	Tons	156.39	156.39	0.5735	0.5735	0.64
VSD Chiller Water Loop Pumps	HVAC	HP	413.78	413.78	1.3510	1.3510	0.85
HVAC controls	HVAC	Control	35.91	35.91	0.2591	0.2591	0.85
EMS	HVAC	Control	1900.00	1900.00	0.1053	0.1053	0.85
VFD - HVAC 10-25 HP	HVAC	HP	666.84	666.84	0.0000	0.0000	0.75
VFD - HVAC Fan 22-49 HP	HVAC	HP	728.23	728.23	0.3968	0.3968	0.75

PG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
VFD - HVAC Fan 50-100 HP	HVAC	HP	821.70	821.70	0.4138	0.4138	0.75
Packaged A/C (>=65k 12 EER)	HVAC	Tons	128.54	128.54	0.7356	0.7356	0.7
Packaged A/C (<65k 15 SEER)	HVAC	Tons	247.85	247.85	0.2038	0.2038	0.7
Demand Controlled Ventilation	HVAC	Control	105.28	105.28	1.3393	1.3393	0.85
Economizer adjustment	HVAC	Tons	105.28	105.28	0.5623	0.5623	0.85
Add economizer	HVAC	Tons	250.74	250.74	0.0000	0.0000	0.85
Evaporative Cooler	HVAC	Tons	1105.48	1105.48	0.5429	0.5429	0.7
Packaged Terminal A/C	HVAC	Tons	114.64	114.64	1.5710	1.5710	0.7
Packaged Terminal Heat Pump	HVAC	Tons	115.41	115.41	1.5702	1.5702	0.7
Fault Detection & Diagnostics	HVAC	Tons	357.00	357.00	0.5625	0.5625	0.85
Variable Refrigerant Flow (VRF) Chiller	HVAC	Tons	99.00	99.00	0.5000	0.5000	0.85
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	48.00	48.00	0.1604	0.1604	0.77
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	84.00	84.00	0.1558	0.1558	0.77
LED: PAR 20	Indoor Lighting	Lamp	89.00	89.00	0.1557	0.1557	0.77
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	129.00	129.00	0.1552	0.1552	0.77
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	145.00	145.00	0.1540	0.1540	0.77
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	155.00	155.00	0.1540	0.1540	0.77
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	184.00	184.00	0.1548	0.1548	0.77
LED: Recessed Fixtures	Indoor Lighting	Lamp	197.00	197.00	0.1524	0.1524	0.77
Occupancy Sensor - Motion	Indoor Lighting	Sensor	172.44	172.44	0.1795	0.1795	0.84
High bay fluorescent	Indoor Lighting	Fixture	435.77	435.77	0.2176	0.2176	0.85
PS Interior HID - Incandescent Base > 150W	Indoor Lighting	Fixture	324.81	324.81	0.1680	0.1680	0.77
PS Interior HID - Incandescent Base <= 150W	Indoor Lighting	Fixture	608.98	608.98	0.1679	0.1679	0.77
PS Interior HID - Mercury Vapor Base	Indoor Lighting	Fixture	406.12	406.12	0.1687	0.1687	0.77
LED Exit sign	Indoor Lighting	Fixture	315.36	315.36	0.1142	0.1142	0.85
CFL Fixture Under 15W	Indoor Lighting	Fixture	170.28	170.28	0.1708	0.1708	0.85
CFL Fixture 16 to 24W	Indoor Lighting	Fixture	207.99	207.99	0.1706	0.1706	0.85

PG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL Fixture Over 24W	Indoor Lighting	Fixture	359.15	359.15	0.1657	0.1657	0.85
Daylighting w/dimmable ballast	Indoor Lighting	Fixture	106.00	106.00	0.1523	0.1523	0.5
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	49.99	64.82	0.1780	0.1791	0.85
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	49.99	64.82	0.1780	0.1791	0.85
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	68.22	112.69	0.1818	0.1570	0.85
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	68.22	112.69	0.1818	0.1570	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	94.46	156.03	0.1810	0.1570	0.85
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	94.46	156.03	0.1810	0.1570	0.85
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	120.70	199.37	0.1814	0.1570	0.85
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	120.70	199.37	0.1814	0.1570	0.85
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	131.20	260.05	0.1814	0.1570	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	131.20	260.05	0.1814	0.1570	0.85
Advanced Generation T8 - 4ft	Indoor Lighting	Fixture	121.71	121.71	0.2634	0.2634	0.85
LED Lighting T8 - 4ft Equiv	Indoor Lighting	Fixture	121.71	121.71	0.2634	0.2634	0.85
Advanced Generation T8 - 8ft	Indoor Lighting	Fixture	54.80	54.80	0.1825	0.1825	0.85
LED Lighting T8 - 8ft Equiv	Indoor Lighting	Fixture	54.80	54.80	0.1825	0.1825	0.85
T12 to T8 - 4ft	Indoor Lighting	Fixture	81.23	81.23	0.1538	0.1538	0.85
T12 to T8 - 8ft	Indoor Lighting	Fixture	186.35	46.46	0.2303	0.2958	0.85
Linear fluorescent delamping 4 ft	Indoor Lighting	Fixture	161.17	252.50	0.2303	0.2653	0.85
Linear fluorescent delamping 8 ft	Indoor Lighting	Fixture	230.00	230.00	0.2303	0.2303	0.85
20W BT-5 Ceramic Metal Halide	Indoor Lighting	Fixture	53.80	53.80	0.2046	0.2046	0.85
Dimmable w/F32T8 & 5W standby CFL lamps	Indoor Lighting	Fixture	173.00	173.00	0.0867	0.0867	0.85
High Efficiency Clothes Washer	Laundry	Clothes Washer	502.03	502.03	0.1466	0.1142	0.7
Other	Other	1,000 SqFt	1000.00	1000.00	0.0000	0.0000	1
Occupancy Sensor - Plug Load	Plug Load	Sensor	133.53	133.53	0.3145	0.3145	0.7

PG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Computer Power Supply	Plug Load	Computer	81.00	81.00	0.1811	0.1811	0.7
Vending Machine Controller - Non-Refrigerated	Plug Load	Vending Machine	368.46	368.46	0.1665	0.1665	0.7
Vending Machine Controller - Refrigerated	Plug Load	Vending Machine	1537.71	1537.71	0.1692	0.1692	0.7
Energy Star TV	Plug Load	TV	28.93	28.93	0.1144	0.1144	0.7
Improved Data Center Design	Plug Load	Power Supply	5686848.01	5686848.01	0.1142	0.1142	0.85
Improved Air-Flow Management	Plug Load	Power Supply	1023632.64	1023632.64	0.1142	0.1142	0.85
Variable-Speed CRAC Compressors	Plug Load	Power Supply	2416910.40	2416910.40	0.1142	0.1142	0.85
Strip Curtain for Walkins	Refrigeration	Sq. Ft.	131.93	131.93	0.0580	0.0580	0.46
Door Gaskets for Walk-in Freezers and Coolers	Refrigeration	Ln. Ft.	19.74	19.74	0.1846	0.1846	0.76
Auto Closer for Glass Door Walkin	Refrigeration	Control	2651.00	2651.00	0.0000	0.0000	0.7
Auto Closer for Solid Door Walkin	Refrigeration	Control	4849.00	4849.00	0.0000	0.0000	0.7
Night Covers - LowTemp Coffin Cases	Refrigeration	Ln. Ft.	22.83	22.83	0.0000	0.0000	0.7
Night Covers - MedTemp Vertical Cases	Refrigeration	Ln. Ft.	34.09	34.09	0.0000	0.0000	0.7
Evaporative Fan ECM Motor	Refrigeration	Motor	673.00	673.00	0.1142	0.1142	0.7
Evaporative Fan Controller for Walkins	Refrigeration	Control	779.00	779.00	0.0591	0.0591	0.7
Anti-Sweat Heater Controls	Refrigeration	Ln. Ft.	883.50	883.50	0.1061	0.1061	0.7
Open Multi-Deck to New High Eff Glass Door Reachins	Refrigeration	Ln. Ft.	967.69	967.69	0.1467	0.1467	0.7
New High Eff LowTemp No ASH Glass Door Case	Refrigeration	Ln. Ft.	510.82	510.82	0.1390	0.1390	0.7
Energy Efficient Air Cooled Condenser	Refrigeration	Tons	1696.64	1696.64	0.1260	0.1260	0.7
Energy Efficient Evaporative Cooled Condenser	Refrigeration	Tons	1892.00	1892.00	0.1312	0.1312	0.7
Multiplex Air Cooled with FHP (fixed setpoint)	Refrigeration	Tons	1252.00	1252.00	0.1244	0.1244	0.7
Multiplex Evaporative Cooled with FHP (fixed setpoint)	Refrigeration	Tons	1634.00	1634.00	0.1322	0.1322	0.7
Suction Line Insulation	Refrigeration	Ln. Ft.	11.37	11.37	0.1864	0.1864	0.7
Single Compressor to Multiplex Air Cooled System	Refrigeration	Tons	340.08	340.08	0.1275	0.1275	0.7
Single Compressor to Multiplex Evaporative Cooled System	Refrigeration	Tons	579.54	579.54	0.1286	0.1286	0.7
Server Virtualization	Whole building	Server	1273.48	1273.48	0.1142	0.1142	0.7
WB - NC - 15%	Whole building	1,000 SqFt	1781.72	1781.72	0.0000	0.0000	0.8

PG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
WB - NC - 25%	Whole building	1,000 SqFt	2487.83	2487.83	5.2190	5.2190	0.8

**Table E-6: PG&E Commercial Electric – Density and Cost Measure Inputs**

PG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Window film	Building Envelope	Sq. Ft.	MOI	48.31	0.74	49.05	10	\$3.12
Cool Roof	Building Envelope	Sq. Ft.	Secondary	657.77	5.53	663.30	15	\$0.45
PS Exterior HID - Incandescent Base > 150W	Exterior Lighting	Fixture	Secondary	0.08	0.00	0.09	15	\$287.00
PS Exterior HID - Incandescent Base <= 150W	Exterior Lighting	Fixture	Secondary	0.02	0.00	0.02	15	\$214.00
PS Exterior HID - Mercury Vapor Base	Exterior Lighting	Fixture	Secondary	0.16	0.00	0.16	15	\$287.00
Lighting Controls - Photocell	Exterior Lighting	Photocell	Secondary	0.36	0.29	0.65	8	\$122.11
Lighting Controls - Timeclock	Exterior Lighting	Timeclock	Secondary	0.50	0.15	0.65	8	\$122.11
LED Outdoor Street/Area Lighting	Exterior Lighting	Fixture	ET	0.23	0.03	0.26	12	\$946.71
Convection Oven	Food Service	Oven	Secondary	0.00	0.00	0.00	12	\$228.00
HE Fryer	Food Service	Fryer	Secondary	0.00	0.00	0.00	12	\$1,112.00
Refrigerator Glass Doors	Food Service	Refrigerator	Secondary	0.00	0.00	0.00	12	\$2,792.00
HE Griddle	Food Service	Griddle	Secondary	0.00	0.00	0.00	12	\$774.00
Food Holding Cabinet	Food Service	Holding Cab	Secondary	0.00	0.00	0.00	12	\$1,200.00
HE Ice Maker	Food Service	Ice Maker	Secondary	0.00	0.00	0.00	12	\$140.00
Combination Oven	Food Service	Oven	Secondary	0.00	0.00	0.00	12	\$3,824.00
Solid Door Reach-in Freezer	Food Service	Freezer	Secondary	0.00	0.00	0.00	12	\$747.00
Solid Door Reach-in Refrigerator	Food Service	Refrigerator	Secondary	0.00	0.00	0.00	12	\$1,825.00
Pressureless Steamer	Food Service	Steamer	Secondary	0.00	0.00	0.00	12	\$2,490.00
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	HVAC	Tons	ET	0.59	0.18	0.77	10	\$50.00
High Performance Rooftop Unit	HVAC	Tons	ET	0.58	0.00	0.58	15	\$602.35
Retro commissioning	HVAC	HP	HIM	0.98	0.02	1.00	5	\$199.73
High Efficiency Centrifugal Chiller	HVAC	Tons	HIM	0.76	0.01	0.77	20	\$176.93
High Efficiency Reciprocating Chiller	HVAC	Tons	HIM	0.75	0.02	0.77	20	\$40.00
VSD Chiller Water Loop Pumps	HVAC	HP	HIM	0.14	0.01	0.15	15	\$380.26

PG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
HVAC controls	HVAC	Control	HIM	0.30	0.70	1.00	11	\$507.58
EMS	HVAC	Control	HIM	0.04	0.02	0.06	15	\$1,000.00
VFD - HVAC 10-25 HP	HVAC	HP	HIM	0.33	0.01	0.34	15	\$388.93
VFD - HVAC Fan 22-49 HP	HVAC	HP	HIM	0.30	0.01	0.30	15	\$284.15
VFD - HVAC Fan 50-100 HP	HVAC	HP	HIM	0.23	0.00	0.23	15	\$151.80
Packaged A/C (>=65k 12 EER)	HVAC	Tons	HIM	0.54	0.00	0.54	15	\$77.96
Packaged A/C (<65k 15 SEER)	HVAC	Tons	HIM	0.58	0.00	0.58	15	\$113.10
Demand Controlled Ventilation	HVAC	Control	Secondary	0.90	0.10	1.00	13	\$980.00
Economizer adjustment	HVAC	Tons	MOI	0.04	0.73	0.77	5	\$73.65
Add economizer	HVAC	Tons	MOI	0.15	0.62	0.77	10	\$155.01
Evaporative Cooler	HVAC	Tons	MOI	0.03	0.56	0.58	15	\$104.79
Packaged Terminal A/C	HVAC	Tons	Secondary	0.19	0.00	0.19	15	\$44.00
Packaged Terminal Heat Pump	HVAC	Tons	Secondary	0.19	0.00	0.19	15	\$135.00
Fault Detection & Diagnostics	HVAC	Tons	ET	0.69	0.08	0.77	15	\$327.00
Variable Refrigerant Flow (VRF) Chiller	HVAC	Tons	ET	0.76	0.01	0.77	15	\$30.00
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	ET	0.03	0.01	0.04	12	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	ET	0.03	0.01	0.04	12	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	11	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	9	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	12	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	ET	0.02	0.01	0.02	10	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	ET	0.02	0.01	0.02	12	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	ET	0.01	0.00	0.01	15	\$44.00
Occupancy Sensor - Motion	Indoor Lighting	Sensor	HIM	1.65	0.05	1.70	8	\$77.00
High bay fluorescent	Indoor Lighting	Fixture	HIM	0.60	0.40	1.00	13	\$360.00
PS Interior HID - Incandescent Base > 150W	Indoor Lighting	Fixture	HIM	0.08	0.00	0.09	15	\$287.00
PS Interior HID - Incandescent Base <=	Indoor Lighting	Fixture	HIM	0.02	0.00	0.02	15	\$214.00



PG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
150W								
PS Interior HID - Mercury Vapor Base	Indoor Lighting	Fixture	HIM	0.16	0.00	0.16	15	\$227.00
LED Exit sign	Indoor Lighting	Fixture	Secondary	0.25	0.21	0.46	16	\$57.75
CFL Fixture Under 15W	Indoor Lighting	Fixture	Secondary	0.45	0.36	0.81	13	\$45.00
CFL Fixture 16 to 24W	Indoor Lighting	Fixture	Secondary	0.19	0.18	0.38	13	\$49.00
CFL Fixture Over 24W	Indoor Lighting	Fixture	Secondary	0.11	0.23	0.34	13	\$51.00
Daylighting w/dimmable ballast	Indoor Lighting	Fixture	MOI	0.55	0.00	0.55	8	\$180.00
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.40	0.26	0.66	4	\$10.03
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.40	0.26	0.66	20	\$16.12
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.40	0.26	0.66	4	\$10.68
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.40	0.26	0.66	20	\$24.20
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.21	0.46	0.67	4	\$11.26
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.21	0.46	0.67	20	\$30.23
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.21	0.46	0.67	4	\$11.84
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.21	0.46	0.67	20	\$40.30
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.16	0.29	0.45	4	\$12.08
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.16	0.29	0.45	20	\$48.36
Advanced Generation T8 - 4ft	Indoor Lighting	Fixture	MOI	2.28	4.91	7.19	5	\$40.00
LED Lighting T8 - 4ft Equiv	Indoor Lighting	Fixture	ET	2.28	4.91	7.19	20	\$164.67
Advanced Generation T8 - 8ft	Indoor Lighting	Fixture	HIM	1.16	0.01	1.17	5	\$49.00
LED Lighting T8 - 8ft Equiv	Indoor Lighting	Fixture	ET	1.16	0.01	1.17	20	\$329.34
T12 to T8 - 4ft	Indoor Lighting	Fixture	HIM	2.28	4.91	7.19	5	\$36.00
T12 to T8 - 8ft	Indoor Lighting	Fixture	HIM	0.97	0.20	1.17	5	\$49.04
Linear fluorescent delamping 4 ft	Indoor Lighting	Fixture	HIM	4.82	0.00	4.82	15	\$60.50
Linear fluorescent delamping 8 ft	Indoor Lighting	Fixture	HIM	1.81	0.00	1.81	15	\$71.00
20W BT-5 Ceramic Metal	Indoor	Fixture	ET	2.20	0.02	2.22	3	\$287.00

PG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Halide	Lighting							
Dimmable w/F32T8 & 5W standby CFL lamps	Indoor Lighting	Fixture	ET	6.47	0.72	7.19	3	\$110.00
High Efficiency Clothes Washer	Laundry	Clothes Washer	Secondary	0.05	0.00	0.05	11	\$259.01
Other	Other	1,000 SqFt	Secondary	0.02	0.00	0.02	20	\$1,000.00
Occupancy Sensor - Plug Load	Plug Load	Sensor	Secondary	1.96	0.00	1.96	8	\$82.25
Computer Power Supply	Plug Load	Computer	Secondary	1.47	0.03	1.49	4	\$5.00
Vending Machine Controller - Non-Refrigerated	Plug Load	Vending Machine	Secondary	0.06	0.00	0.06	5	\$108.00
Vending Machine Controller - Refrigerated	Plug Load	Vending Machine	Secondary	0.06	0.00	0.06	5	\$216.00
Energy Star TV	Plug Load	TV	MOI	0.08	0.08	0.15	5	\$85.99
Improved Data Center Design	Plug Load	Power Supply	ET	0.00	0.00	0.00	15	\$1,137,435
Improved Air-Flow Management	Plug Load	Power Supply	ET	0.00	0.00	0.00	15	\$143,387
Variable-Speed CRAC Compressors	Plug Load	Power Supply	ET	0.00	0.00	0.00	15	\$483,410
Strip Curtain for Walkins	Refrigeration	Sq. Ft.	HIM	1.59	0.06	1.65	4	\$10.22
Door Gaskets for Walk-in Freezers and Coolers	Refrigeration	Ln. Ft.	HIM	0.29	0.01	0.30	4	\$9.61
Auto Closer for Glass Door Walkin	Refrigeration	Control	Secondary	0.03	0.00	0.03	8	\$470.04
Auto Closer for Solid Door Walkin	Refrigeration	Control	Secondary	0.07	0.01	0.08	8	\$470.04
Night Covers - LowTemp Coffin Cases	Refrigeration	Ln. Ft.	Secondary	0.74	0.00	0.74	5	\$42.20
Night Covers - MedTemp Vertical Cases	Refrigeration	Ln. Ft.	Secondary	0.28	0.00	0.28	5	\$42.20
Evaporative Fan ECM Motor	Refrigeration	Motor	Secondary	1.07	0.00	1.07	15	\$230.94
Evaporative Fan Controller for Walkins	Refrigeration	Control	ET	0.07	0.00	0.07	16	\$69.69
Anti-Sweat Heater Controls	Refrigeration	Ln. Ft.	Secondary	0.29	0.01	0.30	12	\$968.23
Open Multi-Deck to New High Eff Glass Door Reachins	Refrigeration	Ln. Ft.	HIM	0.24	0.00	0.24	12	\$554.93
New High Eff LowTemp No ASH Glass Door Case	Refrigeration	Ln. Ft.	HIM	0.16	0.00	0.16	12	\$515.58
Energy Efficient Air Cooled Condenser	Refrigeration	Tons	Secondary	0.35	0.00	0.35	15	\$559.00
Energy Efficient Evaporative Cooled Condenser	Refrigeration	Tons	Secondary	0.46	0.00	0.46	15	\$559.00

PG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Multiplex Air Cooled with FHP (fixed setpoint)	Refrigeration	Tons	Secondary	0.35	0.00	0.35	15	\$279.00
Multiplex Evaporative Cooled with FHP (fixed setpoint)	Refrigeration	Tons	Secondary	0.46	0.00	0.46	15	\$279.00
Suction Line Insulation	Refrigeration	Ln. Ft.	Secondary	0.92	0.02	0.93	11	\$1.72
Single Compressor to Multiplex Air Cooled System	Refrigeration	Tons	Secondary	1.14	0.00	1.14	15	\$3,120.43
Single Compressor to Multiplex Evaporative Cooled System	Refrigeration	Tons	Secondary	0.07	0.00	0.07	15	\$2,905.13
Server Virtualization	Whole building	Server	Secondary	0.04	0.13	0.18	10	\$1,400.00
WB - NC - 15%	Whole building	1,000 SqFt	MOI	1.00	0.00	1.00	15	\$10.00
WB - NC - 25%	Whole building	1,000 SqFt	MOI	1.00	0.00	1.00	15	\$326.73

**Table E-7: PG&E Commercial Gas Savings Measure Inputs**

PG&E Commercial Gas - Savings Measure Inputs					
Efficient Measure Name	DEER Category	Units	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
Convection Oven	Food Service	Oven	306.00	306.00	0.80
HE Fryer	Food Service	Fryer	505.00	505.00	0.80
HE Griddle	Food Service	Griddle	149.00	149.00	0.80
Combination Oven	Food Service	Oven	403.00	403.00	0.80
Pressureless Steamer	Food Service	Steamer	247.00	247.00	0.80
Replacing leaking steam traps	HVAC	Traps	46.00	46.00	0.80
Space Heating Boiler 85% Efficient	HVAC	kBtuh	1.57	1.57	0.80
Space Heating Boiler 95% Efficient	HVAC	kBtuh	1.10	3.68	0.80
Gas Furnace AFUE 92	HVAC	kBtuh	0.92	0.92	0.80
Gas Furnace AFUE 94	HVAC	kBtuh	0.00	1.08	0.80
Retrocommissioning	HVAC	kBtuh	26.18	26.18	0.80
HVAC Controls	HVAC	Control	6.54	6.54	0.96
Fume Hood Controls	HVAC	Fume Hood	113.17	50.51	0.96
EMS	HVAC	Measure Floor Area	887.01	887.01	0.96
Automatic Steam Trap Monitoring	HVAC	Per Steam Trap	345.00	345.00	1.00
Horizontal Axis Clothes Washer	Laundry	Clothes Washer	51.03	51.03	0.96
Other	Other	1,000 SqFt	1.00	1.00	1.00
Water Heating Boiler 85% Efficient	Water Heating	kBtuh	0.59	0.59	0.96
Water Heating Boiler 95% Efficient	Water Heating	kBtuh	2.61	2.61	0.96
Instantaneous Water Heater	Water Heating	Water heater	249.63	220.66	0.96
Storage Water Heater (EF>=.86)	Water Heating	Water heater	115.28	102.10	0.96
Pool Heater - 84% or more efficient	Water Heating	kBtuh	2.78	2.78	0.96
Pipe and Tank Insulation	Water Heating	Sqft	7.64	7.64	0.96
WB - NC - 15%	Whole building	1,000 SqFt	24.45	24.45	0.80
WB - NC - 25%	Whole building	1,000 SqFt	35.64	35.64	0.80

**Table E-8: PG&E Commercial Gas - Density and Cost Measure Inputs**

PG&E Commercial Gas - Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Convection Oven	Food Service	Oven	HIM	0.024	0.000	0.024	12	\$426.00
HE Fryer	Food Service	Fryer	HIM	0.020	0.000	0.020	12	\$905.00
HE Griddle	Food Service	Griddle	HIM	0.024	0.000	0.024	12	\$857.00
Combination Oven	Food Service	Oven	HIM	0.039	0.000	0.040	12	\$5,717.00
Pressureless Steamer	Food Service	Steamer	HIM	0.012	0.000	0.012	12	\$3,732.60
Replacing leaking steam traps	HVAC	Traps	HIM	0.090	0.010	0.100	6	\$77.00
Space Heating Boiler 85% Efficient	HVAC	kBtuh	HIM	13.268	0.159	13.427	20	\$3.29
Space Heating Boiler 95% Efficient	HVAC	kBtuh	HIM	13.279	0.033	13.311	20	\$4.93
Gas Furnace AFUE 92	HVAC	kBtuh	Secondary	3.172	0.006	3.178	20	\$7.52
Gas Furnace AFUE 94	HVAC	kBtuh	Secondary	3.178	0.000	3.178	20	\$8.46
Retrocommissioning	HVAC	kBtuh	HIM	0.989	0.011	1.000	5	\$4.57
HVAC Controls	HVAC	Control	HIM	0.300	0.700	1.000	11	\$507.58
Fume Hood Controls	HVAC	Fume Hood	Secondary	0.002	0.002	0.004	13	\$4,000.00
EMS	HVAC	Measure Floor Area	MOI	0.042	0.018	0.060	15	\$507.58
Automatic Steam Trap Monitoring	HVAC	Per Steam Trap	ET	0.090	0.010	0.100	15	\$1,118.50
Horizontal Axis Clothes Washer	Laundry	Clothes Washer	Secondary	0.052	0.000	0.052	11	\$105.33
Other	Other	1,000 SqFt	Secondary	0.017	0.000	0.017	20	\$10.00
Water Heating Boiler 85% Efficient	Water Heating	kBtuh	Secondary	13.365	0.062	13.428	20	\$3.36
Water Heating Boiler 95% Efficient	Water Heating	kBtuh	Secondary	13.308	0.004	13.311	20	\$3.36
Instantaneous Water Heater	Water Heating	Water heater	Secondary	0.018	0.000	0.018	20	\$164.42
Storage Water Heater (EF>=.86)	Water Heating	Water heater	Secondary	0.025	0.000	0.025	15	\$176.85
Pool Heater - 84% or more efficient	Water Heating	kBtuh	Secondary	1.864	0.000	1.864	5	\$2.00
Pipe and Tank Insulation	Water Heating	Sqft	HIM	2.461	0.013	2.473	18	\$10.10
WB - NC - 15%	Whole building	1,000 SqFt	MOI	1.000	0.000	1.000	15	\$10.00
WB - NC - 25%	Whole building	1,000 SqFt	MOI	1.000	0.000	1.000	15	\$326.73



## Appendix F – SCE Measure Level Inputs

**Table F-1: SCE Residential - Electric Savings Measure Inputs**

SCE Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Recycle refrigerator	Appliance	Appliance	SFE	1295.39	601.47	0.1991	0.1936	0.61
Recycle freezer	Appliance	Appliance	SFE	749.36	755.91	0.2191	0.1918	0.61
ES Refrigerator	Appliance	Appliance	SFE	79.24	218.51	0.2077	0.1945	0.75
ES Dishwasher	Appliance	Appliance	SFE	69.95	69.95	0.1225	0.0709	0.80
ES Freezer	Appliance	Appliance	SFE	59.10	185.64	0.1945	0.1957	0.75
High Efficiency Pool Pump	Appliance	Pump	SFE	506.00	506.00	0.0672	0.0672	0.69
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	172.00	565.65	0.0000	1.2357	0.70
High perf window	Building Envelope	Home	SFE	162.00	162.00	0.0000	1.2357	0.55
ES Room AC	HVAC	Appliance	SFE	43.99	43.99	0.1986	0.1986	0.80
HVAC Controls	HVAC	Control	SFE	136.95	136.95	0.0000	0.0000	0.49
Residential Night Ventilation Cooling	HVAC	Per Home	SFE	250.23	250.23	0.0000	0.0000	0.80
Rooftop or split system SEER 15	HVAC	Home	SFE	173.28	54.57	0.5245	0.4162	0.80
Rooftop or split system SEER 18	HVAC	Home	SFE	241.57	78.13	0.4253	0.3973	0.80
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	SFE	140.63	140.63	1.2800	1.2800	0.80
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	SFE	564.76	564.76	1.1659	1.1659	0.80
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	SFE	295.70	295.70	1.6923	1.6923	0.80
Residential HVAC for Hot-Dry Climates	HVAC	Per Home	SFE	156.94	156.94	1.5738	1.9601	0.80
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	SFE	86.58	86.58	4.3393	4.3393	0.80
HVAC Quality Maintenance	HVAC	Per Home	SFE	283.91	279.30	0.4903	0.4901	0.85
CFL: ≤7W Screw-In Indoor	Indoor Lighting	Lamp	SFE	13.66	7.47	0.1694	0.1476	0.60
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	SFE	13.66	7.47	0.1694	0.1476	0.80
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	SFE	25.38	19.61	0.1705	0.1412	0.60
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	SFE	25.38	19.61	0.1705	0.1412	0.80
CFL Fixture	Indoor Lighting	Fixture	SFE	39.19	35.42	0.1378	0.1372	0.73

SCE Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Super T-8	Indoor Lighting	Lamp	SFE	13.28	18.35	0.1506	0.1090	0.73
Specialty CFLs	Indoor Lighting	Lamp	SFE	17.62	17.62	0.1470	0.1470	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	SFE	35.14	27.01	0.1694	0.1486	0.60
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	SFE	35.14	27.01	0.1694	0.1486	0.80
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	SFE	44.90	36.23	0.1694	0.1542	0.60
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	SFE	44.90	36.23	0.1694	0.1542	0.80
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	SFE	58.56	65.32	0.1694	0.1650	0.60
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	SFE	58.56	65.32	0.1694	0.1650	0.80
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	SFE	12.00	12.00	0.0095	0.0095	0.85
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	SFE	21.00	21.00	0.0081	0.0081	0.85
LED: PAR 20	Indoor Lighting	Lamp	SFE	22.00	22.00	0.0078	0.0078	0.85
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	SFE	32.00	32.00	0.0089	0.0089	0.85
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	SFE	37.00	37.00	0.0077	0.0077	0.85
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	SFE	39.00	39.00	0.0088	0.0088	0.85
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	SFE	46.00	46.00	0.0087	0.0087	0.85
LED: Recessed Fixtures	Indoor Lighting	Lamp	SFE	125.00	125.00	0.0087	0.0087	0.85
ES Clothes Washer	Laundry	Appliance	SFE	308.05	308.05	0.0869	0.0772	0.85
Other	Other	Home	SFE	15505.00	15505.00	0.1600	0.1600	1.00
CFL: 7W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	18.04	26.84	0.0000	0.0000	0.60
LED Lighting 40W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	18.04	26.84	0.0000	0.0000	0.80
CFL: 13W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	33.50	49.85	0.0000	0.0000	0.60
LED Lighting 60W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	33.50	49.85	0.0000	0.0000	0.80
CFL: 18W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	46.38	69.02	0.0000	0.0000	0.60
CFL: 23W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	59.27	88.19	0.0000	0.0000	0.60
CFL: >25W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	77.30	115.03	0.0000	0.0000	0.85



SCE Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL Fixture - Outdoor	Outdoor Lighting	Fixture	SFE	59.26	102.27	0.0000	0.0000	0.73
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	SFE	19.30	19.30	0.0000	0.0000	0.73
Efficient Set Top Box	Plug Loads	Box	SFE	149.00	149.00	0.0000	0.0000	0.80
ES LCD/Plasma TVs	Plug Loads	TV	SFE	42.32	46.60	0.4879	0.4554	0.80
Efficient Game Console	Plug Loads	Device	SFE	31.50	31.50	0.0000	0.0000	0.80
Other Water Heating	Water Heating	Home	SFE	1250.00	1250.00	0.0216	0.0216	0.80
Heat Pump Water Heaters	Water Heating	Per Home	SFE	1313.73	1313.73	0.1300	0.1300	0.80
Recycle refrigerator	Appliance	Appliance	MFE	1295.39	601.47	0.1991	0.1936	0.61
Recycle freezer	Appliance	Appliance	MFE	749.36	755.91	0.2191	0.1918	0.61
ES Refrigerator	Appliance	Appliance	MFE	86.06	276.90	0.1700	0.1727	0.75
ES Dishwasher	Appliance	Appliance	MFE	49.87	49.87	0.1272	0.1422	0.80
ES Freezer	Appliance	Appliance	MFE	64.29	201.08	0.1654	0.1691	0.75
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	120.40	0.34	0.0000	0.8641	0.70
High perf window	Building Envelope	Home	MFE	113.40	113.40	0.0000	0.0000	0.55
ES Room AC	HVAC	Appliance	MFE	11.92	11.92	0.4616	0.4616	0.80
HVAC Controls	HVAC	Control	MFE	67.13	67.13	0.0000	0.0000	0.49
Rooftop or split system SEER 15	HVAC	Home	MFE	167.58	52.78	0.3269	0.2594	0.80
Rooftop or split system SEER 18	HVAC	Home	MFE	285.82	92.45	0.2765	0.2583	0.80
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	MFE	53.63	53.63	2.1467	2.1467	0.80
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	MFE	205.37	205.37	2.2897	2.2897	0.80
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	MFE	115.98	115.98	3.3100	3.3100	0.80
Residential HVAC for Hot-Dry Climates	HVAC	Per Unit	MFE	59.85	59.85	2.6395	3.2872	0.80
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	MFE	33.02	33.02	7.2774	7.2774	0.80
HVAC Quality Maintenance	HVAC	Per Home	MFE	106.69	104.96	0.2051	0.2050	0.85
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	MFE	13.61	8.75	0.1705	0.1412	0.60
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	MFE	13.61	8.75	0.1705	0.1412	0.80
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	MFE	25.28	23.13	0.1705	0.1316	0.60

SCE Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	MFE	25.28	23.13	0.1705	0.1316	0.80
CFL Fixture	Indoor Lighting	Fixture	MFE	39.19	43.44	0.1378	0.1119	0.73
Super T-8	Indoor Lighting	Lamp	MFE	38.14	38.14	0.1049	0.1049	0.73
Specialty CFLs	Indoor Lighting	Lamp	MFE	19.63	19.63	0.1351	0.1351	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	MFE	35.00	39.34	0.1705	0.1254	0.60
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	MFE	35.00	39.34	0.1705	0.1254	0.80
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	MFE	44.72	47.45	0.1705	0.1172	0.60
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	MFE	44.72	47.45	0.1705	0.1172	0.80
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	MFE	58.33	88.89	0.1705	0.1157	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	MFE	58.33	88.89	0.1705	0.1157	0.80
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	MFE	12.00	12.00	0.0095	0.0095	0.85
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	MFE	21.00	21.00	0.0081	0.0081	0.85
LED: PAR 20	Indoor Lighting	Lamp	MFE	22.00	22.00	0.0078	0.0078	0.85
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	MFE	32.00	32.00	0.0089	0.0089	0.85
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	MFE	37.00	37.00	0.0077	0.0077	0.85
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	MFE	39.00	39.00	0.0088	0.0088	0.85
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	MFE	46.00	46.00	0.0087	0.0087	0.85
LED: Recessed Fixtures	Indoor Lighting	Lamp	MFE	125.00	125.00	0.0087	0.0087	0.85
ES Clothes Washer	Laundry	Appliance	MFE	281.78	281.77	0.0892	0.0757	0.85
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	MFE	19.30	19.30	0.0000	0.0000	0.80
Efficient Set Top Box	Plug Loads	Box	MFE	149.00	149.00	0.0000	0.0000	0.80
ES LCD/Plasma TVs	Plug Loads	TV	MFE	42.32	46.60	0.4879	0.4554	0.80
Efficient Game Console	Plug Loads	Device	MFE	31.50	31.50	0.0000	0.0000	0.80
Heat Pump Water Heaters	Water Heating	Per Home	MFE	499.05	499.05	0.1300	0.1300	0.80
Low Income	Low Income	Home	LI	286.00	286.00	0.2894	0.2894	1.00

SCE Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
WB - NC - 15%	Whole building	Home	RNC	698.00	698.00	0.3100	0.3100	0.80
WB - NC - 25%	Whole building	Home	RNC	1602.00	1602.00	0.8900	0.8900	0.80
WB - NC - 30%	Whole building	Home	RNC	1775.00	1775.00	0.9300	0.9300	0.80

**Table F-2: SCE Residential Electric - Density and Cost Measure Inputs**

SCE Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Recycle refrigerator	Appliance	Appliance	SFE	HIM	0.364	0.000	0.364	5	\$92.20
Recycle freezer	Appliance	Appliance	SFE	HIM	0.005	0.000	0.005	4	\$92.20
ES Refrigerator	Appliance	Appliance	SFE	HIM	0.827	0.173	1.000	14	\$123.02
ES Dishwasher	Appliance	Appliance	SFE	Secondary	0.032	0.000	0.032	11	\$220.00
ES Freezer	Appliance	Appliance	SFE	Secondary	0.195	0.000	0.195	11	\$35.00
High Efficiency Pool Pump	Appliance	Pump	SFE	HIM	0.158	0.008	0.166	10	\$600.00
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	Secondary	0.263	0.317	0.580	20	\$131.43
High perf window	Building Envelope	Home	SFE	Secondary	0.208	0.372	0.580	20	\$2,383.32
ES Room AC	HVAC	Appliance	SFE	Secondary	0.140	0.016	0.155	9	\$41.58
HVAC Controls	HVAC	Control	SFE	MOI	0.579	0.001	0.580	12	\$118.69
Residential Night Ventilation Cooling	HVAC	Per Home	SFE	ET	0.150	0.000	0.150	10	\$993.00
Rooftop or split system SEER 15	HVAC	Home	SFE	MOI	0.579	0.001	0.580	15	\$849.66
Rooftop or split system SEER 18	HVAC	Home	SFE	MOI	0.579	0.001	0.580	15	\$2,127.72
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	SFE	ET	0.579	0.000	0.579	15	\$1,130.00
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	SFE	ET	0.529	0.050	0.579	15	\$3,343.17
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	SFE	ET	0.579	0.000	0.579	15	\$1,464.92
Residential HVAC for Hot-Dry Climates	HVAC	Per Home	SFE	ET	0.579	0.000	0.579	15	\$746.00
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	SFE	ET	0.335	0.000	0.335	15	\$4,241.80
HVAC Quality Maintenance	HVAC	Per Home	SFE	ET	0.651	0.302	0.953	8	\$1,152.17
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	0.430	0.038	0.468	7	\$4.14
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	0.430	0.038	0.468	20	\$18.52
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	8.632	4.150	12.783	7	\$4.79
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	8.632	4.150	12.783	20	\$26.58
CFL Fixture	Indoor Lighting	Fixture	SFE	HIM	1.855	0.636	2.492	16	\$53.41
Super T-8	Indoor Lighting	Lamp	SFE	MOI	3.450	0.000	3.450	5	\$2.79

SCE Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Specialty CFLs	Indoor Lighting	Lamp	SFE	HIM	14.613	2.197	16.810	5	\$7.16
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	1.683	0.936	2.618	7	\$5.37
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	1.683	0.936	2.618	20	\$32.63
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	2.022	2.399	4.421	7	\$5.95
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	2.022	2.399	4.421	20	\$42.70
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	0.156	0.367	0.523	7	\$7.52
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	0.156	0.367	0.523	20	\$50.76
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	SFE	ET	0.050	0.005	0.055	20	\$44.00
ES Clothes Washer	Laundry	Appliance	SFE	HIM	0.033	0.009	0.041	12	\$105.33
Other	Other	Home	SFE	Secondary	0.002	0.000	0.002	20	\$1,000.00
CFL: 7W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.091	0.001	0.092	5	\$12.06
LED Lighting 40W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	ET	0.091	0.001	0.092	20	\$61.55
CFL: 13W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	1.068	0.422	1.490	5	\$13.43
LED Lighting 60W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	ET	1.068	0.422	1.490	20	\$61.55
CFL: 18W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.177	0.126	0.303	5	\$14.60
CFL: 23W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.257	0.236	0.494	5	\$15.77
CFL: >25W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.009	0.043	0.052	5	\$16.95
CFL Fixture - Outdoor	Outdoor Lighting	Fixture	SFE	HIM	0.325	0.094	0.419	16	\$45.52

SCE Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	SFE	HIM	2.567	0.066	2.633	5	\$14.41
Efficient Set Top Box	Plug Loads	Box	SFE	MOI	1.167	0.000	1.167	5	\$19.02
ES LCD/Plasma TVs	Plug Loads	TV	SFE	MOI	0.719	0.000	0.719	5	\$85.99
Efficient Game Console	Plug Loads	Device	SFE	MOI	0.422	0.000	0.422	5	\$228.59
Other Water Heating	Water Heating	Home	SFE	Secondary	0.042	0.000	0.042	20	\$400.00
Heat Pump Water Heaters	Water Heating	Per Home	SFE	ET	0.050	0.000	0.050	10	\$750.00
Recycle refrigerator	Appliance	Appliance	MFE	HIM	0.110	0.000	0.110	5	\$92.20
Recycle freezer	Appliance	Appliance	MFE	HIM	0.001	0.000	0.001	4	\$92.20
ES Refrigerator	Appliance	Appliance	MFE	HIM	0.828	0.172	1.000	14	\$123.02
ES Dishwasher	Appliance	Appliance	MFE	Secondary	0.108	0.002	0.110	11	\$220.00
ES Freezer	Appliance	Appliance	MFE	Secondary	0.070	0.000	0.070	11	\$35.00
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	Secondary	0.259	0.321	0.580	20	\$49.81
High perf window	Building Envelope	Home	MFE	Secondary	0.355	0.225	0.580	20	\$1,319.73
ES Room AC	HVAC	Appliance	MFE	Secondary	0.203	0.016	0.218	9	\$41.58
HVAC Controls	HVAC	Control	MFE	MOI	0.579	0.001	0.580	12	\$118.69
Rooftop or split system SEER 15	HVAC	Home	MFE	MOI	0.579	0.001	0.580	15	\$416.50
Rooftop or split system SEER 18	HVAC	Home	MFE	MOI	0.579	0.001	0.580	15	\$1,043.00
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	MFE	ET	0.579	0.000	0.579	15	\$1,130.00
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	MFE	ET	0.529	0.050	0.579	15	\$1,823.83
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	MFE	ET	0.579	0.000	0.579	15	\$1,499.53
Residential HVAC for Hot-Dry Climates	HVAC	Per Unit	MFE	ET	0.579	0.000	0.579	15	\$746.00
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	MFE	ET	0.335	0.000	0.335	15	\$4,241.80
HVAC Quality Maintenance	HVAC	Per Home	MFE	ET	0.666	0.293	0.959	8	\$1,152.17
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.168	0.000	0.168	7	\$4.14
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.168	0.000	0.168	20	\$18.52
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	3.737	1.820	5.557	7	\$4.79

SCE Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	3.737	1.820	5.557	20	\$26.58
CFL Fixture	Indoor Lighting	Fixture	MFE	HIM	0.537	0.832	1.370	16	\$53.41
Super T-8	Indoor Lighting	Lamp	MFE	MOI	2.908	0.000	2.908	5	\$2.79
Specialty CFLs	Indoor Lighting	Lamp	MFE	HIM	4.210	0.634	4.844	5	\$7.16
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	1.071	0.915	1.987	7	\$5.37
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	1.071	0.915	1.987	20	\$32.63
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.966	1.079	2.045	7	\$5.95
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.966	1.079	2.045	20	\$42.70
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.084	0.176	0.260	7	\$7.52
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.084	0.176	0.260	20	\$50.76
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	MFE	ET	0.050	0.005	0.055	20	\$44.00
ES Clothes Washer	Laundry	Appliance	MFE	HIM	0.138	0.024	0.161	12	\$105.33
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	MFE	HIM	1.755	0.045	1.800	5	\$14.41
Efficient Set Top Box	Plug Loads	Box	MFE	MOI	0.750	0.000	0.750	5	\$19.02
ES LCD/Plasma TVs	Plug Loads	TV	MFE	MOI	0.370	0.000	0.370	5	\$85.99
Efficient Game Console	Plug Loads	Device	MFE	MOI	0.320	0.000	0.320	5	\$228.59
Heat Pump Water Heaters	Water Heating	Per Home	MFE	ET	0.160	0.000	0.160	10	\$750.00
Low Income	Low Income	Home	LI	Low Income	1.000	0.000	1.000	10	\$678.00

SCE Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
WB - NC - 15%	Whole building	Home	RNC	Whole building	286.000	0.289	0.289	1	\$300.00
WB - NC - 25%	Whole building	Home	RNC	Whole building	698.000	0.310	0.310	20	\$3,220.00
WB - NC - 30%	Whole building	Home	RNC	Whole building	1602.000	0.890	0.890	20	\$5,414.00



**Table F-3: SCE Commercial Electric - Savings Measure Inputs**

SCE Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Window film	Building Envelope	Sq. Ft.	4.46	4.46	1.9263	1.9263	0.85
Cool Roof	Building Envelope	Sq. Ft.	0.11	0.11	0.0000	0.0000	0.70
PS Exterior HID - Incandescent Base > 150W	Exterior Lighting	Fixture	285.51	285.51	0.0563	0.0563	0.77
PS Exterior HID - Incandescent Base <= 150W	Exterior Lighting	Fixture	519.60	519.60	0.0589	0.0589	0.77
PS Exterior HID - Mercury Vapor Base	Exterior Lighting	Fixture	357.10	357.10	0.0485	0.0485	0.77
Lighting Controls - Photocell	Exterior Lighting	Photocell	262.80	262.80	0.0016	0.0016	0.81
Lighting Controls - Timeclock	Exterior Lighting	Timeclock	262.80	262.80	0.0016	0.0016	0.81
LED Outdoor Street/Area Lighting	Exterior Lighting	Fixture	340.20	340.20	0.0445	0.0445	0.85
Convection Oven	Food Service	Oven	1879.00	1879.00	0.2288	0.2288	0.70
HE Fryer	Food Service	Fryer	1166.00	1166.00	0.1544	0.1544	0.70
Refrigerator Glass Doors	Food Service	Refrigerator	1622.00	1622.00	0.1201	0.1201	0.70
HE Griddle	Food Service	Griddle	1886.00	1886.00	0.2121	0.2121	0.70
Food Holding Cabinet	Food Service	Holding Cab	9307.50	9307.50	0.1826	0.1826	0.70
HE Ice Maker	Food Service	Ice Maker	1197.10	1197.10	0.2740	0.2740	0.70
Combination Oven	Food Service	Oven	18431.00	18431.00	0.2051	0.2051	0.70
Solid Door Reach-in Freezer	Food Service	Freezer	1201.00	1201.00	0.1203	0.1203	0.70
Solid Door Reach-in Refrigerator	Food Service	Refrigerator	650.00	650.00	0.1203	0.1203	0.70
Pressureless Steamer	Food Service	Steamer	11070.00	11070.00	0.1925	0.1925	0.70
Retro commissioning	HVAC	HP	462.00	462.00	1.2728	1.2728	0.70
High Efficiency Centrifugal Chiller	HVAC	Tons	180.01	180.01	0.4308	0.4308	0.64
High Efficiency Reciprocating Chiller	HVAC	Tons	194.65	194.65	0.4691	0.4691	0.64
VSD Chiller Water Loop Pumps	HVAC	HP	413.78	413.78	1.3510	1.3510	0.85
HVAC controls	HVAC	Control	35.91	35.91	0.2591	0.2591	0.85
EMS	HVAC	Control	1900.00	1900.00	0.1053	0.1053	0.85
VFD - HVAC 10-25 HP	HVAC	HP	705.36	705.36	0.2263	0.2263	0.75
VFD - HVAC Fan 22-49 HP	HVAC	HP	683.16	683.16	0.0000	0.0003	0.75
VFD - HVAC Fan 50-100 HP	HVAC	HP	488.14	488.14	0.0000	0.0005	0.75
Packaged A/C (>=65k 12 EER)	HVAC	Tons	158.58	158.58	0.6073	0.6073	0.70

SCE Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Packaged A/C (<65k 15 SEER)	HVAC	Tons	252.37	252.37	0.2493	0.2493	0.70
Demand Controlled Ventilation	HVAC	Control	105.28	105.28	1.3393	1.3393	0.85
Economizer adjustment	HVAC	Tons	105.28	105.28	0.5623	0.5623	0.85
Add economizer	HVAC	Tons	250.74	250.74	0.0000	0.0000	0.85
Evaporative Cooler	HVAC	Tons	1105.48	1105.48	0.5429	0.5429	0.70
Packaged Terminal A/C	HVAC	Tons	114.64	114.64	1.5710	1.5710	0.70
Packaged Terminal Heat Pump	HVAC	Tons	115.41	115.41	1.5702	1.5702	0.70
Fault Detection & Diagnostics	HVAC	Tons	357.00	357.00	0.5625	0.5625	0.85
Variable Refrigerant Flow (VRF) Chiller	HVAC	Tons	99.00	99.00	0.5000	0.5000	0.85
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	HVAC	Tons	405.21	405.21	0.0002	0.0002	0.50
High Performance Rooftop Unit	HVAC	Tons	1905.75	1905.75	0.2493	0.2493	0.70
Occupancy Sensor - Motion	Indoor Lighting	Sensor	172.44	172.44	0.1795	0.1795	0.84
High bay fluorescent	Indoor Lighting	Fixture	435.77	435.77	0.2176	0.2176	0.85
PS Interior HID - Incandescent Base > 150W	Indoor Lighting	Fixture	324.81	324.81	0.1680	0.1680	0.77
PS Interior HID - Incandescent Base <= 150W	Indoor Lighting	Fixture	608.98	608.98	0.1679	0.1679	0.77
PS Interior HID - Mercury Vapor Base	Indoor Lighting	Fixture	406.12	406.12	0.1687	0.1687	0.77
LED Exit sign	Indoor Lighting	Fixture	285.12	285.12	0.1318	0.1318	0.85
CFL Fixture Under 15W	Indoor Lighting	Fixture	170.28	170.28	0.1708	0.1708	0.85
CFL Fixture 16 to 24W	Indoor Lighting	Fixture	207.99	207.99	0.1706	0.1706	0.85
CFL Fixture Over 24W	Indoor Lighting	Fixture	359.15	359.15	0.1657	0.1657	0.85
Daylighting w/dimmable ballast	Indoor Lighting	Fixture	106.00	106.00	0.1523	0.1523	0.50
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	49.99	64.19	0.1780	0.1785	0.85
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	49.99	64.19	0.1780	0.1785	0.85
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	91.64	119.20	0.1779	0.1785	0.85
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	91.64	119.20	0.1779	0.1785	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	127.75	165.05	0.1785	0.1785	0.85
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	127.75	165.05	0.1785	0.1785	0.85

SCE Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	161.07	210.90	0.1782	0.1785	0.85
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	161.07	210.90	0.1782	0.1785	0.85
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	210.36	275.08	0.1835	0.1785	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	210.36	275.08	0.1835	0.1785	0.85
Advanced Generation T8 - 4ft	Indoor Lighting	Fixture	121.25	121.25	0.2418	0.2418	0.85
LED Lighting T8 - 4ft Equiv	Indoor Lighting	Fixture	121.25	121.25	0.2418	0.2418	0.85
Advanced Generation T8 - 8ft	Indoor Lighting	Fixture	54.80	54.80	0.1825	0.1825	0.85
LED Lighting T8 - 8ft Equiv	Indoor Lighting	Fixture	54.80	54.80	0.1825	0.1825	0.85
T12 to T8 - 4ft	Indoor Lighting	Fixture	81.23	81.23	0.1538	0.1538	0.85
T12 to T8 - 8ft	Indoor Lighting	Fixture	44.44	51.34	0.1803	0.2484	0.85
Linear fluorescent delamping 4 ft	Indoor Lighting	Fixture	185.14	252.84	0.2133	0.2422	0.85
Linear fluorescent delamping 8 ft	Indoor Lighting	Fixture	263.49	470.39	0.2140	0.2422	0.85
20W BT-5 Ceramic Metal Halide	Indoor Lighting	Fixture	53.77	53.77	0.2046	0.2046	0.85
Dimmable w/F32T8 & 5W standby CFL lamps	Indoor Lighting	Fixture	173.00	173.00	0.0867	0.0867	0.85
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	48.00	48.00	0.1604	0.1604	0.77
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	84.00	84.00	0.1558	0.1558	0.77
LED: PAR 20	Indoor Lighting	Lamp	89.00	89.00	0.1557	0.1557	0.77
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	129.00	129.00	0.1552	0.1552	0.77
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	145.00	145.00	0.1540	0.1540	0.77
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	155.00	155.00	0.1540	0.1540	0.77
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	184.00	184.00	0.1548	0.1548	0.77
LED: Recessed Fixtures	Indoor Lighting	Lamp	197.00	197.00	0.1524	0.1524	0.77
High Efficiency Clothes Washer	Laundry	Clothes Washer	502.03	502.03	0.1466	0.1466	0.00
Other	Other	1,000 SqFt	1000.00	1000.00	0.0000	0.0000	1.00
Occupancy Sensor - Plug Load	Plug Load	Sensor	143.00	143.00	0.3566	0.3566	0.70

SCE Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Computer Power Supply	Plug Load	Computer	81.00	81.00	0.1811	0.1811	0.70
Vending Machine Controller - Non-Refrigerated	Plug Load	Vending Machine	368.46	368.46	0.1665	0.1665	0.70
Vending Machine Controller - Refrigerated	Plug Load	Vending Machine	1537.71	1537.71	0.1692	0.1692	0.70
Energy Star TV	Plug Load	TV	28.93	28.93	0.1144	0.1144	0.70
Improved Data Center Design	Plug Load	Power Supply	5686848.01	5686848.01	0.1142	0.1142	0.85
Improved Air-Flow Management	Plug Load	Power Supply	1023632.64	1023632.64	0.1142	0.1142	0.85
Variable-Speed CRAC Compressors	Plug Load	Power Supply	2416910.40	2416910.40	0.1142	0.1142	0.85
Strip Curtain for Walkins	Refrigeration	Sq. Ft.	174.06	174.06	0.1869	0.1869	0.46
Door Gaskets for Walk-in Freezers and Coolers	Refrigeration	Ln. Ft.	19.74	19.74	0.1846	0.1846	0.76
Auto Closer for Glass Door Walkin	Refrigeration	Control	2651.00	2651.00	0.0000	0.0000	0.70
Auto Closer for Solid Door Walkin	Refrigeration	Control	4849.00	4849.00	0.0000	0.0000	0.70
Night Covers - LowTemp Coffin Cases	Refrigeration	Ln. Ft.	22.83	22.83	0.0000	0.0000	0.70
Night Covers - MedTemp Vertical Cases	Refrigeration	Ln. Ft.	34.09	34.09	0.0000	0.0000	0.70
Evaporative Fan ECM Motor	Refrigeration	Motor	673.00	673.00	0.1142	0.1142	0.70
Evaporative Fan Controller for Walkins	Refrigeration	Control	779.00	779.00	0.0591	0.0591	0.70
Anti-Sweat Heater Controls	Refrigeration	Ln. Ft.	883.50	883.50	0.1061	0.1061	0.70
Open Multi-Deck to New High Eff Glass Door Reachins	Refrigeration	Ln. Ft.	967.69	967.69	0.1467	0.1467	0.70
New High Eff LowTemp No ASH Glass Door Case	Refrigeration	Ln. Ft.	510.82	510.82	0.1390	0.1390	0.70
Energy Efficient Air Cooled Condenser	Refrigeration	Tons	1696.64	1696.64	0.1260	0.1260	0.70
Energy Efficient Evaporative Cooled Condenser	Refrigeration	Tons	1892.00	1892.00	0.1312	0.1312	0.70
Multiplex Air Cooled with FHP (fixed setpoint)	Refrigeration	Tons	1252.00	1252.00	0.1244	0.1244	0.70
Multiplex Evaporative Cooled with FHP (fixed setpoint)	Refrigeration	Tons	1634.00	1634.00	0.1322	0.1322	0.70
Suction Line Insulation	Refrigeration	Ln. Ft.	11.37	11.37	0.1864	0.1864	0.70
Single Compressor to Multiplex Air Cooled System	Refrigeration	Tons	340.08	340.08	0.1275	0.1275	0.70
Single Compressor to Multiplex Evaporative Cooled System	Refrigeration	Tons	579.54	579.54	0.1286	0.1286	0.70
Server Virtualization	Whole building	Server	1273.48	1273.48	0.1142	0.1142	0.70
WB - NC - 15%	Whole building	1,000 SqFt	1781.72	1781.72	0.0000	0.0000	0.80

SCE Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
WB - NC - 25%	Whole building	1,000 SqFt	2487.83	2487.83	5.2190	5.2190	0.80

**Table F-4: SCE Commercial Electric – Density and Cost Measure Inputs**

SCE Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Window film	Building Envelope	Sq. Ft.	MOI	43.15	0.67	43.82	10	\$3.12
Cool Roof	Building Envelope	Sq. Ft.	Secondary	632.13	9.63	641.77	15	\$0.45
PS Exterior HID - Incandescent Base > 150W	Exterior Lighting	Fixture	Secondary	0.09	0.00	0.09	15	\$287.00
PS Exterior HID - Incandescent Base <= 150W	Exterior Lighting	Fixture	Secondary	0.01	0.00	0.01	15	\$214.00
PS Exterior HID - Mercury Vapor Base	Exterior Lighting	Fixture	Secondary	0.15	0.00	0.15	15	\$287.00
Lighting Controls - Photocell	Exterior Lighting	Photocell	Secondary	0.32	0.25	0.57	8	\$122.11
Lighting Controls - Timeclock	Exterior Lighting	Timeclock	Secondary	0.32	0.25	0.57	8	\$122.11
LED Outdoor Street/Area Lighting	Exterior Lighting	Fixture	ET	0.20	0.02	0.22	12	\$946.71
Convection Oven	Food Service	Oven	Secondary	0.00	0.00	0.00	12	\$228.00
HE Fryer	Food Service	Fryer	Secondary	0.00	0.00	0.00	12	\$1,112.00
Refrigerator Glass Doors	Food Service	Refrigerator	Secondary	0.00	0.00	0.00	12	\$2,792.00
HE Griddle	Food Service	Griddle	Secondary	0.00	0.00	0.00	12	\$774.00
Food Holding Cabinet	Food Service	Holding Cab	Secondary	0.00	0.00	0.00	12	\$1,200.00
HE Ice Maker	Food Service	Ice Maker	Secondary	0.00	0.00	0.00	12	\$140.00
Combination Oven	Food Service	Oven	Secondary	0.00	0.00	0.00	12	\$3,824.00
Solid Door Reach-in Freezer	Food Service	Freezer	Secondary	0.00	0.00	0.00	12	\$747.00
Solid Door Reach-in Refrigerator	Food Service	Refrigerator	Secondary	0.00	0.00	0.00	12	\$1,825.00
Pressureless Steamer	Food Service	Steamer	Secondary	0.00	0.00	0.00	12	\$2,490.00
Retro commissioning	HVAC	HP	HIM	0.98	0.02	1.00	5	\$199.73
High Efficiency Centrifugal Chiller	HVAC	Tons	HIM	0.76	0.01	0.77	20	\$176.93
High Efficiency Reciprocating Chiller	HVAC	Tons	HIM	0.75	0.02	0.77	20	\$40.00
VSD Chiller Water Loop Pumps	HVAC	HP	HIM	0.17	0.01	0.17	15	\$380.26
HVAC controls	HVAC	Control	HIM	0.30	0.70	1.00	11	\$507.58

SCE Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
EMS	HVAC	Control	HIM	0.04	0.02	0.06	15	\$1,000.00
VFD - HVAC 10-25 HP	HVAC	HP	HIM	0.47	0.02	0.49	15	\$388.93
VFD - HVAC Fan 22-49 HP	HVAC	HP	HIM	0.30	0.01	0.30	15	\$284.15
VFD - HVAC Fan 50-100 HP	HVAC	HP	HIM	0.23	0.00	0.23	15	\$151.80
Packaged A/C (>=65k 12 EER)	HVAC	Tons	HIM	0.54	0.00	0.54	15	\$77.96
Packaged A/C (<65k 15 SEER)	HVAC	Tons	HIM	0.58	0.00	0.58	15	\$113.10
Demand Controlled Ventilation	HVAC	Control	Secondary	0.90	0.10	1.00	13	\$980.00
Economizer adjustment	HVAC	Tons	MOI	0.04	0.73	0.77	5	\$73.65
Add economizer	HVAC	Tons	MOI	0.15	0.62	0.77	10	\$155.01
Evaporative Cooler	HVAC	Tons	MOI	0.03	0.56	0.58	15	\$104.79
Packaged Terminal A/C	HVAC	Tons	Secondary	0.19	0.00	0.19	15	\$44.00
Packaged Terminal Heat Pump	HVAC	Tons	Secondary	0.19	0.00	0.19	15	\$135.00
Fault Detection & Diagnostics	HVAC	Tons	ET	0.69	0.08	0.77	15	\$327.00
Variable Refrigerant Flow (VRF) Chiller	HVAC	Tons	ET	0.76	0.01	0.77	15	\$30.00
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	HVAC	Tons	ET	0.59	0.18	0.77	10	\$50.00
High Performance Rooftop Unit	HVAC	Tons	ET	0.58	0.00	0.58	15	\$602.35
Occupancy Sensor - Motion	Indoor Lighting	Sensor	HIM	1.68	0.05	1.73	8	\$77.00
High bay fluorescent	Indoor Lighting	Fixture	HIM	0.60	0.40	1.00	13	\$360.00
PS Interior HID - Incandescent Base > 150W	Indoor Lighting	Fixture	HIM	0.08	0.00	0.09	15	\$287.00
PS Interior HID - Incandescent Base <= 150W	Indoor Lighting	Fixture	HIM	0.02	0.00	0.02	15	\$214.00
PS Interior HID - Mercury Vapor Base	Indoor Lighting	Fixture	HIM	0.16	0.00	0.16	15	\$227.00
LED Exit sign	Indoor Lighting	Fixture	Secondary	0.20	0.18	0.38	16	\$57.75
CFL Fixture Under 15W	Indoor Lighting	Fixture	Secondary	0.37	0.29	0.66	13	\$45.00
CFL Fixture 16 to 24W	Indoor Lighting	Fixture	Secondary	0.12	0.16	0.28	13	\$49.00
CFL Fixture Over 24W	Indoor Lighting	Fixture	Secondary	0.08	0.23	0.31	13	\$51.00
Daylighting w/dimmable ballast	Indoor Lighting	Fixture	MOI	0.55	0.00	0.55	8	\$180.00
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.27	0.17	0.43	5	\$10.03
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.27	0.17	0.43	20	\$16.12

SCE Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.27	0.17	0.43	5	\$10.68
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.27	0.17	0.43	20	\$24.18
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.13	0.34	0.47	5	\$11.26
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.13	0.34	0.47	20	\$30.23
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.13	0.34	0.47	5	\$11.84
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.13	0.34	0.47	20	\$40.30
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.11	0.30	0.42	5	\$13.41
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.11	0.30	0.42	20	\$48.36
Advanced Generation T8 - 4ft	Indoor Lighting	Fixture	MOI	7.64	0.00	7.64	5	\$40.00
LED Lighting T8 - 4ft Equiv	Indoor Lighting	Fixture	ET	7.64	0.00	7.64	20	\$164.67
Advanced Generation T8 - 8ft	Indoor Lighting	Fixture	HIM	1.23	0.03	1.26	5	\$13.36
LED Lighting T8 - 8ft Equiv	Indoor Lighting	Fixture	ET	1.23	0.03	1.26	20	\$329.34
T12 to T8 - 4ft	Indoor Lighting	Fixture	HIM	1.96	5.68	7.64	5	\$36.00
T12 to T8 - 8ft	Indoor Lighting	Fixture	HIM	1.02	0.23	1.26	5	\$38.81
Linear fluorescent delamping 4 ft	Indoor Lighting	Fixture	HIM	4.39	0.00	4.39	15	\$60.00
Linear fluorescent delamping 8 ft	Indoor Lighting	Fixture	HIM	1.72	0.00	1.72	15	\$71.00
20W BT-5 Ceramic Metal Halide	Indoor Lighting	Fixture	ET	2.03	0.02	2.05	3	\$220.95
Dimmable w/F32T8 & 5W standby CFL lamps	Indoor Lighting	Fixture	ET	7.14	0.79	7.94	3	\$110.00
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	ET	0.03	0.01	0.04	12	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	ET	0.03	0.01	0.04	12	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	11	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	9	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	12	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	ET	0.02	0.01	0.02	10	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	ET	0.02	0.01	0.02	12	\$44.38

SCE Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
LED: Recessed Fixtures	Indoor Lighting	Lamp	ET	0.01	0.00	0.01	15	\$44.00
High Efficiency Clothes Washer	Laundry	Clothes Washer	Secondary	0.05	0.00	0.05	11	\$259.01
Other	Other	1,000 SqFt	Secondary	0.02	0.00	0.02	20	\$1,000.00
Occupancy Sensor - Plug Load	Plug Load	Sensor	Secondary	1.91	0.00	1.91	8	\$82.25
Computer Power Supply	Plug Load	Computer	Secondary	1.46	0.03	1.49	4	\$5.00
Vending Machine Controller - Non-Refrigerated	Plug Load	Vending Machine	Secondary	0.07	0.00	0.07	5	\$108.00
Vending Machine Controller - Refrigerated	Plug Load	Vending Machine	Secondary	0.06	0.00	0.06	5	\$216.00
Energy Star TV	Plug Load	TV	MOI	0.08	0.08	0.15	5	\$85.99
Improved Data Center Design	Plug Load	Power Supply	ET	0.00	0.00	0.00	10	\$1,137,435
Improved Air-Flow Management	Plug Load	Power Supply	ET	0.00	0.00	0.00	10	\$143,387
Variable-Speed CRAC Compressors	Plug Load	Power Supply	ET	0.00	0.00	0.00	10	\$483,410
Strip Curtain for Walkins	Refrigeration	Sq. Ft.	HIM	1.59	0.06	1.65	4	\$10.22
Door Gaskets for Walk-in Freezers and Coolers	Refrigeration	Ln. Ft.	HIM	0.29	0.01	0.30	4	\$9.61
Auto Closer for Glass Door Walkin	Refrigeration	Control	Secondary	0.03	0.00	0.03	8	\$470.04
Auto Closer for Solid Door Walkin	Refrigeration	Control	Secondary	0.07	0.01	0.08	8	\$470.04
Night Covers - LowTemp Coffin Cases	Refrigeration	Ln. Ft.	Secondary	0.74	0.00	0.74	5	\$42.20
Night Covers - MedTemp Vertical Cases	Refrigeration	Ln. Ft.	Secondary	0.28	0.00	0.28	5	\$42.20
Evaporative Fan ECM Motor	Refrigeration	Motor	Secondary	1.07	0.00	1.07	15	\$230.94
Evaporative Fan Controller for Walkins	Refrigeration	Control	ET	0.07	0.00	0.07	16	\$69.69
Anti-Sweat Heater Controls	Refrigeration	Ln. Ft.	Secondary	0.29	0.01	0.30	12	\$968.23
Open Multi-Deck to New High Eff Glass Door Reachins	Refrigeration	Ln. Ft.	HIM	0.24	0.00	0.24	12	\$554.93
New High Eff LowTemp No ASH Glass Door Case	Refrigeration	Ln. Ft.	HIM	0.16	0.00	0.16	12	\$515.58
Energy Efficient Air Cooled Condenser	Refrigeration	Tons	Secondary	0.35	0.00	0.35	15	\$559.00
Energy Efficient Evaporative Cooled Condenser	Refrigeration	Tons	Secondary	0.46	0.00	0.46	15	\$559.00
Multiplex Air Cooled with FHP (fixed setpoint)	Refrigeration	Tons	Secondary	0.35	0.00	0.35	15	\$279.00
Multiplex Evaporative Cooled with FHP (fixed setpoint)	Refrigeration	Tons	Secondary	0.46	0.00	0.46	15	\$279.00
Suction Line Insulation	Refrigeration	Ln. Ft.	Secondary	0.92	0.02	0.93	11	\$1.72
Single Compressor to Multiplex	Refrigeration	Tons	Secondary	1.14	0.00	1.14	15	\$3,120.43



SCE Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Air Cooled System								
Single Compressor to Multiplex Evaporative Cooled System	Refrigeration	Tons	Secondary	0.07	0.00	0.07	15	\$2,905.13
Server Virtualization	Whole bldg	Server	Secondary	0.04	0.13	0.18	10	\$1,400.00
WB - NC - 15%	Whole bldg	1,000 SqFt	MOI	1.00	0.00	1.00	15	\$10.00
WB - NC - 25%	Whole bldg	1,000 SqFt	MOI	1.00	0.00	1.00	15	\$326.73

## Appendix G – SCG Measure Level Inputs

**Table G-1: SCG Residential Gas Savings Measure Inputs**

SCG Residential Gas - Savings Measure Inputs						
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
ES Dishwasher	Appliance	Appliance	SFE	3.94	3.94	0.8
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	42.60	53.10	0.7
High perf window	Building Envelope	Home	SFE	34.03	34.03	0.6
High Efficiency Furnace	HVAC	Furnace	SFE	26.70	26.70	0.6
Duct sealing and insul	HVAC	Home	SFE	9.07	9.07	0.8
High Efficiency Space heating boiler	HVAC	Boiler	SFE	868.57	868.57	0.6
ES Clothes Washer	Laundry	Appliance	SFE	11.12	11.12	0.9
Other	Other	Home	SFE	0.09	0.09	1.0
Water heater controls on Boilers	Water Heating	Control	SFE	39.50	11.12	0.6
Low Flow Showerhead	Water Heating	Home	SFE	8.88	9.44	0.9
Faucet Aerator	Water Heating	Home	SFE	5.53	5.53	0.9
High Efficiency Pool Heater	Water Heating	Pool	SFE	47.81	47.81	0.8
High Efficiency Water heating boiler	Water Heating	Boiler	SFE	73.00	73.00	0.8
High Efficiency Water Heater	Water Heating	Unit	SFE	34.83	32.75	0.6
Condensing Gas Water Heater	Water Heating	Unit	SFE	57.33	57.33	1.0
ES Dishwasher	Appliance	Appliance	MFE	2.78	2.78	0.8
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	35.15	42.87	0.7
High perf window	Building Envelope	Home	MFE	20.69	20.69	0.6
High Efficiency Furnace	HVAC	Furnace	MFE	10.31	10.31	0.6
Duct sealing and insul	HVAC	Home	MFE	1.18	1.18	0.8
High Efficiency Space heating boiler	HVAC	Boiler	MFE	868.57	868.57	0.6
ES Clothes Washer	Laundry	Appliance	MFE	10.38	10.38	0.9
Water heater controls on Boilers	Water Heating	Control	MFE	39.50	11.12	0.6
Low Flow Showerhead	Water Heating	Home	MFE	8.88	9.44	0.9
Faucet Aerator	Water Heating	Home	MFE	5.53	5.53	0.9
High Efficiency Water heating boiler	Water Heating	Boiler	MFE	73.00	73.00	0.8
High Efficiency Water Heater	Water Heating	Unit	MFE	32.18	30.11	0.6
Condensing Gas Water Heater	Water Heating	Unit	MFE	53.85	53.85	1.0
Low Income	Low Income	Home	LI	20.00	20.00	1.0

SCG Residential Gas - Savings Measure Inputs						
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
WB - NC - 15%	Whole building	Home	RNC	77.63	77.63	0.8
WB - NC - 25%	Whole building	Home	RNC	150.70	150.70	0.8
WB - NC - 30%	Whole building	Home	RNC	199.47	199.47	0.8

**Table G-2: SCG Residential Gas - Density and Cost Measure Inputs**

SCG Residential Gas - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Category	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
ES Dishwasher	Appliance	Appliance	SFE	Appliance	0.627	0.005	0.632	11	\$211.47
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	Home	0.470	0.392	0.862	20	\$1,770.96
High perf window	Building Envelope	Home	SFE	Home	0.309	0.553	0.862	20	\$2,384.62
High Efficiency Furnace	HVAC	Furnace	SFE	Furnace	0.856	0.006	0.862	20	\$463.51
Duct sealing and insul	HVAC	Home	SFE	Home	0.635	0.227	0.862	18	\$87.51
High Efficiency Space heating boiler	HVAC	Boiler	SFE	Boiler	0.000	0.000	0.000	20	\$297.85
ES Clothes Washer	Laundry	Appliance	SFE	Appliance	0.700	0.185	0.884	11	\$475.18
Other	Other	Home	SFE	Home	1.000	0.000	1.000	20	\$0.90
Water heater controls on Boilers	Water Heating	Control	SFE	Control	0.000	0.000	0.000	10	\$17.52
Low Flow Showerhead	Water Heating	Home	SFE	Home	0.223	0.674	0.897	10	\$31.65
Faucet Aerator	Water Heating	Home	SFE	Home	0.419	0.478	0.897	10	\$9.50
High Efficiency Pool Heater	Water Heating	Pool	SFE	Pool	0.077	0.000	0.077	10	\$794.00
High Efficiency Water heating boiler	Water Heating	Boiler	SFE	Boiler	0.000	0.000	0.000	20	\$297.85
High Efficiency Water Heater	Water Heating	Unit	SFE	Unit	0.811	0.086	0.897	11	\$142.90
Condensing Gas Water Heater	Water Heating	Unit	SFE	Unit	0.850	0.000	0.850	15	\$604.00
ES Dishwasher	Appliance	Appliance	MFE	HIM	0.448	0.002	0.451	11	\$211.47
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	HIM	0.360	0.289	0.649	20	\$1,003.47
High perf window	Building Envelope	Home	MFE	Secondary	0.397	0.252	0.649	20	\$1,449.76
High Efficiency Furnace	HVAC	Furnace	MFE	HIM	0.646	0.003	0.649	20	\$463.51
Duct sealing and insul	HVAC	Home	MFE	HIM	0.524	0.125	0.649	18	\$87.51
High Efficiency Space heating boiler	HVAC	Boiler	MFE	HIM	0.026	0.000	0.026	20	\$297.85
ES Clothes Washer	Laundry	Appliance	MFE	HIM	0.627	0.108	0.735	11	\$475.18
Water heater controls on Boilers	Water Heating	Control	MFE	HIM	0.009	0.004	0.013	10	\$17.52
Low Flow Showerhead	Water Heating	Home	MFE	HIM	0.188	0.568	0.756	10	\$31.65
Faucet Aerator	Water Heating	Home	MFE	HIM	0.353	0.403	0.756	10	\$9.50
High Efficiency Water heating boiler	Water Heating	Boiler	MFE	HIM	0.009	0.001	0.010	20	\$297.85

SCG Residential Gas - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Category	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
High Efficiency Water Heater	Water Heating	Unit	MFE	HIM	0.693	0.063	0.756	11	\$142.90
Condensing Gas Water Heater	Water Heating	Unit	MFE	ET	0.850	0.000	0.850	15	\$604.00
Low Income	Low Income	Home	LI	Low Income	1.000	0.000	1.000	10	\$380.00
WB - NC - 15%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$300.00
WB - NC - 25%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$1,985.00
WB - NC - 30%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$2,971.00

**Table G-3: SCG Commercial Gas Savings Measure Inputs**

SCG Commercial Gas - Savings Measure Inputs					
Efficient Measure Name	DEER Category	Units	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
Convection Oven	Food Service	Oven	306.00	306.00	0.80
HE Fryer	Food Service	Fryer	505.00	505.00	0.80
HE Griddle	Food Service	Griddle	149.00	149.00	0.80
Combination Oven	Food Service	Oven	403.00	403.00	0.80
Pressureless Steamer	Food Service	Steamer	247.00	247.00	0.80
Replacing leaking steam traps	HVAC	Traps	46.00	46.00	0.80
Space Heating Boiler 85% Efficient	HVAC	kBtuh	1.32	1.32	0.80
Space Heating Boiler 95% Efficient	HVAC	kBtuh	0.77	3.13	0.80
Gas Furnace AFUE 92	HVAC	kBtuh	0.44	0.44	0.80
Gas Furnace AFUE 94	HVAC	kBtuh	0.00	0.52	0.80
Retrocommissioning	HVAC	kBtuh	14.05	14.05	0.80
HVAC Controls	HVAC	Control	3.51	3.51	0.96
Fume Hood Controls	HVAC	Fume Hood	103.52	46.20	0.96
EMS	HVAC	Measure Floor Area	887.01	887.01	0.96
Automatic Steam Trap Monitoring	HVAC	Per Steam Trap	345.00	345.00	1.00
Horizontal Axis Clothes Washer	Laundry	Clothes Washer	11.96	13.82	0.96
Other	Other	1,000 SqFt	1.00	1.00	1.00
Water Heating Boiler 85% Efficient	Water Heating	kBtuh	0.50	0.50	0.96
Water Heating Boiler 95% Efficient	Water Heating	kBtuh	2.21	2.21	0.96
Instantaneous Water Heater	Water Heating	Water heater	242.25	211.31	0.96
Storage Water Heater (EF>=.86)	Water Heating	Water heater	110.06	96.70	0.96
Pool Heater - 84% or more efficient	Water Heating	kBtuh	2.78	2.78	0.96
Pipe and Tank Insulation	Water Heating	Sqft	7.64	7.64	0.96
WB - NC - 15%	Whole building	1,000 SqFt	24.45	24.45	0.80
WB - NC - 25%	Whole building	1,000 SqFt	35.64	35.64	0.80

**Table G-4: SCG Commercial Gas - Density and Cost Measure Inputs**

SCG Commercial Gas - Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Convection Oven	Food Service	Oven	HIM	0.019	0.000	0.019	12	\$213.00
HE Fryer	Food Service	Fryer	HIM	0.013	0.000	0.014	12	\$652.00
HE Griddle	Food Service	Griddle	HIM	0.015	0.000	0.015	12	\$428.50
Combination Oven	Food Service	Oven	HIM	0.034	0.000	0.034	12	\$2,858.50
Pressureless Steamer	Food Service	Steamer	HIM	0.011	0.000	0.011	12	\$1,866.30
Replacing leaking steam traps	HVAC	Traps	HIM	0.090	0.010	0.100	6	\$92.76
Space Heating Boiler 85% Efficient	HVAC	kBtuh	HIM	10.922	0.123	11.045	20	\$1.64
Space Heating Boiler 95% Efficient	HVAC	kBtuh	HIM	10.491	0.008	10.499	20	\$2.47
Gas Furnace AFUE 92	HVAC	kBtuh	Secondary	4.107	0.004	4.111	20	\$3.76
Gas Furnace AFUE 94	HVAC	kBtuh	Secondary	4.111	0.000	4.111	20	\$4.23
Retrocommissioning	HVAC	kBtuh	HIM	0.991	0.009	1.000	5	\$2.25
HVAC Controls	HVAC	Control	HIM	0.300	0.700	1.000	11	\$253.79
Fume Hood Controls	HVAC	Fume Hood	Secondary	0.014	0.018	0.032	13	\$2,000.00
EMS	HVAC	Measure Floor Area	MOI	0.042	0.018	0.060	15	\$253.79
Automatic Steam Trap Monitoring	HVAC	Per Steam Trap	ET	0.090	0.010	0.100	15	\$1.00
Horizontal Axis Clothes Washer	Laundry	Clothes Washer	Secondary	0.081	0.000	0.081	11	\$5.00
Other	Other	1,000 SqFt	Secondary	0.017	0.000	0.017	20	\$7.50
Water Heating Boiler 85% Efficient	Water Heating	kBtuh	Secondary	10.958	0.061	11.018	20	\$559.25
Water Heating Boiler 95% Efficient	Water Heating	kBtuh	Secondary	10.495	0.003	10.499	20	\$129.51
Instantaneous Water Heater	Water Heating	Water heater	Secondary	0.017	0.000	0.017	20	\$1.68
Storage Water Heater (EF>=.86)	Water Heating	Water heater	Secondary	0.023	0.000	0.024	15	\$1.68
Pool Heater - 84% or more efficient	Water Heating	kBtuh	Secondary	0.876	0.000	0.876	5	\$82.21
Pipe and Tank Insulation	Water Heating	Sqft	HIM	2.407	0.067	2.474	18	\$88.43
WB - NC - 15%	Whole building	1,000 SqFt	MOI	1.000	0.000	1.000	15	\$5.00
WB - NC - 25%	Whole building	1,000 SqFt	MOI	1.000	0.000	1.000	15	\$163.36

## Appendix H – SDG&E Measure Level Inputs

**Table H-1: SDG&E Residential - Electric Savings Measure Inputs**

SDG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Recycle refrigerator	Appliance	Appliance	SFE	1266.62	631.64	0.1700	0.1615	0.61
Recycle freezer	Appliance	Appliance	SFE	751.03	792.66	0.1849	0.1591	0.61
ES Refrigerator	Appliance	Appliance	SFE	75.95	247.69	0.2717	0.1541	0.75
ES Dishwasher	Appliance	Appliance	SFE	70.29	70.29	0.0556	0.0288	0.80
ES Freezer	Appliance	Appliance	SFE	57.96	177.12	0.2474	0.1501	0.75
High Efficiency Pool Pump	Appliance	Pump	SFE	506.00	506.00	0.0672	0.0672	0.69
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	172.00	384.35	0.0000	0.0000	0.27
High perf window	Building Envelope	Home	SFE	162.00	162.00	0.0000	0.0000	0.55
ES Room AC	HVAC	Appliance	SFE	25.71	25.71	0.1768	0.1768	0.80
HVAC Controls	HVAC	Control	SFE	85.31	85.31	0.0000	0.0000	0.49
Residential Night Ventilation Cooling	HVAC	Per Home	SFE	139.71	139.71	0.0000	0.0000	0.80
Rooftop or split system SEER 15	HVAC	Home	SFE	119.15	42.87	0.6944	0.4890	0.80
Rooftop or split system SEER 18	HVAC	Home	SFE	168.49	63.30	0.5431	0.4712	0.80
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	SFE	78.52	78.52	2.2926	2.2926	0.80
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	SFE	110.53	110.53	4.1723	4.1723	0.80
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	SFE	50.28	50.28	8.4595	8.4595	0.80
Residential HVAC for Hot-Dry Climates	HVAC	Per Home	SFE	87.62	87.62	2.8188	2.8188	0.80
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	SFE	48.34	48.34	7.7720	7.7720	0.80
HVAC Quality Maintenance	HVAC	Per Home	SFE	195.63	191.81	0.7601	0.8908	0.85
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	SFE	13.66	7.23	0.1694	0.1435	0.60
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	SFE	13.66	7.23	0.1694	0.1435	0.80
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	SFE	25.38	18.97	0.1705	0.1373	0.60
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	SFE	25.38	18.97	0.1705	0.1373	0.80
CFL Fixture	Indoor Lighting	Fixture	SFE	34.27	34.27	0.1113	0.1113	0.73



SDG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Super T-8	Indoor Lighting	Lamp	SFE	14.08	14.08	0.0710	0.0710	0.73
Specialty CFLs	Indoor Lighting	Lamp	SFE	17.05	17.05	0.1429	0.1429	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	SFE	35.14	26.13	0.1694	0.1445	0.60
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	SFE	35.14	26.13	0.1694	0.1445	0.80
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	SFE	44.90	35.06	0.1694	0.1499	0.60
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	SFE	44.90	35.06	0.1694	0.1499	0.80
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	SFE	58.56	63.20	0.1694	0.1605	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	SFE	58.56	63.20	0.1694	0.1605	0.80
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	SFE	12.00	12.00	0.0095	0.0095	0.85
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	SFE	21.00	21.00	0.0081	0.0081	0.85
LED: PAR 20	Indoor Lighting	Lamp	SFE	22.00	22.00	0.0078	0.0078	0.85
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	SFE	32.00	32.00	0.0089	0.0089	0.85
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	SFE	37.00	37.00	0.0077	0.0077	0.85
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	SFE	39.00	39.00	0.0088	0.0088	0.85
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	SFE	46.00	46.00	0.0087	0.0087	0.85
LED: Recessed Fixtures	Indoor Lighting	Lamp	SFE	125.00	125.00	0.0087	0.0087	0.85
ES Clothes Washer	Laundry	Appliance	SFE	306.76	306.75	0.1006	0.0692	0.85
Other	Other	Home	SFE	15505.00	15505.00	0.1600	0.1600	1.00
CFL: 7W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	18.04	26.84	0.0000	0.0000	0.60
LED Lighting 40W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	18.04	26.84	0.0000	0.0000	0.80
CFL: 13W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	33.50	49.85	0.0000	0.0000	0.60
LED Lighting 60W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	33.50	49.85	0.0000	0.0000	0.80
CFL: 18W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	46.38	69.02	0.0000	0.0000	0.60
CFL: 23W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	59.27	88.19	0.0000	0.0000	0.60
CFL: >25W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	77.30	115.03	0.0000	0.0000	0.85

SDG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL Fixture - Outdoor	Outdoor Lighting	Fixture	SFE	59.26	102.27	0.0000	0.0000	0.73
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	SFE	19.30	19.30	0.0000	0.0000	0.73
Efficient Set Top Box	Plug Loads	Box	SFE	149.00	149.00	0.0000	0.0000	0.80
ES LCD/Plasma TVs	Plug Loads	TV	SFE	46.60	46.60	0.4554	0.4554	0.80
Efficient Game Console	Plug Loads	Device	SFE	31.50	31.50	0.0000	0.0000	0.80
Other Water Heating	Water Heating	Home	SFE	1250.00	1250.00	0.0216	0.0216	0.80
Heat Pump Water Heaters	Water Heating	Per Home	SFE	1317.41	1317.41	0.1300	0.1300	0.80
Recycle refrigerator	Appliance	Appliance	MFE	1266.62	631.64	0.1700	0.1615	0.61
Recycle freezer	Appliance	Appliance	MFE	751.03	792.66	0.1849	0.1591	0.61
ES Refrigerator	Appliance	Appliance	MFE	83.30	260.15	0.1755	0.1390	0.75
ES Dishwasher	Appliance	Appliance	MFE	50.90	50.90	0.0790	0.0421	0.80
ES Freezer	Appliance	Appliance	MFE	62.41	189.48	0.1764	0.1372	0.75
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	120.40	0.32	0.0000	0.0000	0.27
High perf window	Building Envelope	Home	MFE	113.40	113.40	0.0000	0.0000	0.55
ES Room AC	HVAC	Appliance	MFE	4.09	4.09	0.0000	0.0000	0.80
HVAC Controls	HVAC	Control	MFE	41.10	41.10	0.0000	0.0000	0.49
Rooftop or split system SEER 15	HVAC	Home	MFE	91.50	32.92	0.5937	0.4181	0.80
Rooftop or split system SEER 18	HVAC	Home	MFE	150.26	56.45	0.4578	0.3972	0.80
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	MFE	29.94	29.94	3.8448	3.8448	0.80
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	MFE	291.34	291.34	1.9695	1.9695	0.80
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	MFE	99.57	99.57	4.9567	4.9567	0.80
Residential HVAC for Hot-Dry Climates	HVAC	Per Unit	MFE	33.42	33.42	4.7275	4.7275	0.80
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	MFE	18.44	18.44	13.0344	13.0344	0.80
HVAC Quality Maintenance	HVAC	Per Home	MFE	56.27	55.17	0.4354	0.5102	0.85
CFL: ≤7W Screw-In Indoor	Indoor Lighting	Lamp	MFE	13.61	8.47	0.1705	0.1373	0.60
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	MFE	13.61	8.47	0.1705	0.1373	0.80
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	MFE	25.28	22.38	0.1705	0.1279	0.60

SDG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	MFE	25.28	22.38	0.1705	0.1279	0.80
CFL Fixture	Indoor Lighting	Fixture	MFE	42.03	42.03	0.1088	0.1088	0.73
Super T-8	Indoor Lighting	Lamp	MFE	25.55	25.55	0.0972	0.0972	0.73
Specialty CFLs	Indoor Lighting	Lamp	MFE	18.99	18.99	0.1313	0.1313	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	MFE	35.00	38.44	0.1705	0.1219	0.60
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	MFE	35.00	38.44	0.1705	0.1219	0.80
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	MFE	44.72	45.91	0.1705	0.1140	0.60
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	MFE	44.72	45.91	0.1705	0.1140	0.80
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	MFE	58.33	86.01	0.1705	0.1125	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	MFE	58.33	86.01	0.1705	0.1125	0.80
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	MFE	12.00	12.00	0.0095	0.0095	0.85
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	MFE	21.00	21.00	0.0081	0.0081	0.85
LED: PAR 20	Indoor Lighting	Lamp	MFE	22.00	22.00	0.0078	0.0078	0.85
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	MFE	32.00	32.00	0.0089	0.0089	0.85
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	MFE	37.00	37.00	0.0077	0.0077	0.85
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	MFE	39.00	39.00	0.0088	0.0088	0.85
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	MFE	46.00	46.00	0.0087	0.0087	0.85
LED: Recessed Fixtures	Indoor Lighting	Lamp	MFE	125.00	125.00	0.0087	0.0087	0.85
ES Clothes Washer	Laundry	Appliance	MFE	281.13	281.13	0.0887	0.0752	0.85
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	MFE	19.30	19.30	0.0000	0.0000	0.73
Efficient Set Top Box	Plug Loads	Box	MFE	149.00	149.00	0.0000	0.0000	0.80
ES LCD/Plasma TVs	Plug Loads	TV	MFE	46.60	46.60	0.4554	0.4554	0.80
Efficient Game Console	Plug Loads	Device	MFE	31.50	31.50	0.0000	0.0000	0.80
Heat Pump Water Heaters	Water Heating	Per Home	MFE	500.44	500.44	0.1300	0.1300	0.80
Low Income	Low Income	Home	LI	397.00	397.00	0.2290	0.2290	1.00

SDG&E Residential Electric - Savings Measure Inputs								
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
WB - NC - 15%	Whole building	Home	RNC	698.00	698.00	0.3100	0.3100	0.80
WB - NC - 25%	Whole building	Home	RNC	1602.00	1602.00	0.8900	0.8900	0.80
WB - NC - 30%	Whole building	Home	RNC	1775.00	1775.00	0.9300	0.9300	0.80

**Table H-2: SDG&E Residential Electric - Density and Cost Measure Inputs**

SDG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Recycle refrigerator	Appliance	Appliance	SFE	HIM	0.285	0.000	0.285	5	\$92.20
Recycle freezer	Appliance	Appliance	SFE	HIM	0.004	0.000	0.004	4	\$92.20
ES Refrigerator	Appliance	Appliance	SFE	HIM	0.860	0.140	1.000	14	\$123.02
ES Dishwasher	Appliance	Appliance	SFE	Secondary	0.039	0.000	0.040	11	\$220.00
ES Freezer	Appliance	Appliance	SFE	Secondary	0.216	0.000	0.216	11	\$35.00
High Efficiency Pool Pump	Appliance	Pump	SFE	HIM	0.174	0.013	0.187	10	\$600.00
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	Secondary	0.193	0.237	0.430	20	\$131.43
High perf window	Building Envelope	Home	SFE	Secondary	0.161	0.269	0.430	20	\$2,492.54
ES Room AC	HVAC	Appliance	SFE	Secondary	0.088	0.010	0.098	9	\$41.58
HVAC Controls	HVAC	Control	SFE	MOI	0.429	0.001	0.430	12	\$118.69
Residential Night Ventilation Cooling	HVAC	Per Home	SFE	ET	0.150	0.000	0.150	10	\$993.00
Rooftop or split system SEER 15	HVAC	Home	SFE	MOI	0.429	0.001	0.430	15	\$780.64
Rooftop or split system SEER 18	HVAC	Home	SFE	MOI	0.429	0.001	0.430	15	\$1,954.88
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	SFE	ET	0.429	0.000	0.429	15	\$1,130.00
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	SFE	ET	0.379	0.050	0.429	15	\$1,823.83
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	SFE	ET	0.429	0.000	0.429	15	\$1,632.67
Residential HVAC for Hot-Dry Climates	HVAC	Per Home	SFE	ET	0.429	0.000	0.429	15	\$746.00
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	SFE	ET	0.430	0.000	0.430	15	\$4,241.80
HVAC Quality Maintenance	HVAC	Per Home	SFE	ET	0.651	0.302	0.953	8	\$1,152.17
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	0.430	0.038	0.468	7	\$4.14
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	0.430	0.038	0.468	20	\$58.55
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	8.632	4.150	12.783	7	\$4.79
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	8.632	4.150	12.783	20	\$58.55
CFL Fixture	Indoor Lighting	Fixture	SFE	HIM	1.855	0.636	2.492	16	\$53.41
Super T-8	Indoor Lighting	Lamp	SFE	MOI	3.450	0.000	3.450	5	\$2.79

SDG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Specialty CFLs	Indoor Lighting	Lamp	SFE	HIM	14.613	2.197	16.810	5	\$7.16
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	1.683	0.936	2.618	7	\$5.37
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	1.683	0.936	2.618	20	\$32.63
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	2.022	2.399	4.421	7	\$5.95
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	2.022	2.399	4.421	20	\$42.70
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	SFE	HIM	0.156	0.367	0.523	7	\$7.52
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	SFE	ET	0.156	0.367	0.523	20	\$50.76
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	SFE	ET	0.020	0.005	0.025	20	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	SFE	ET	0.050	0.005	0.055	20	\$44.00
ES Clothes Washer	Laundry	Appliance	SFE	HIM	0.036	0.015	0.051	12	\$105.33
Other	Other	Home	SFE	Secondary	0.002	0.000	0.002	20	\$1,000.00
CFL: 7W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.091	0.001	0.092	5	\$12.06
LED Lighting 40W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	ET	0.091	0.001	0.092	20	\$58.55
CFL: 13W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	1.068	0.422	1.490	5	\$13.43
LED Lighting 60W Equiv - Outdoor	Outdoor Lighting	Lamp	SFE	ET	1.068	0.422	1.490	20	\$58.55
CFL: 18W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.177	0.126	0.303	5	\$14.60
CFL: 23W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.257	0.236	0.494	5	\$15.77
CFL: >25W Screw-In Outdoor	Outdoor Lighting	Lamp	SFE	MOI	0.009	0.043	0.052	5	\$16.95
CFL Fixture - Outdoor	Outdoor Lighting	Fixture	SFE	HIM	0.325	0.094	0.419	16	\$45.52

SDG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	SFE	HIM	2.254	0.058	2.312	5	\$14.41
Efficient Set Top Box	Plug Loads	Box	SFE	MOI	1.140	0.000	1.140	5	\$19.02
ES LCD/Plasma TVs	Plug Loads	TV	SFE	MOI	0.661	0.000	0.661	5	\$85.99
Efficient Game Console	Plug Loads	Device	SFE	MOI	0.446	0.000	0.446	5	\$228.59
Other Water Heating	Water Heating	Home	SFE	Secondary	0.042	0.000	0.042	20	\$400.00
Heat Pump Water Heaters	Water Heating	Per Home	SFE	ET	0.069	0.001	0.070	10	\$1,100.00
Recycle refrigerator	Appliance	Appliance	MFE	HIM	0.080	0.000	0.080	5	\$92.20
Recycle freezer	Appliance	Appliance	MFE	HIM	0.000	0.000	0.000	4	\$92.20
ES Refrigerator	Appliance	Appliance	MFE	HIM	0.907	0.093	1.000	14	\$123.02
ES Dishwasher	Appliance	Appliance	MFE	Secondary	0.116	0.001	0.117	11	\$220.00
ES Freezer	Appliance	Appliance	MFE	Secondary	0.032	0.000	0.032	11	\$35.00
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	Secondary	0.182	0.248	0.430	20	\$49.81
High perf window	Building Envelope	Home	MFE	Secondary	0.251	0.179	0.430	20	\$1,431.55
ES Room AC	HVAC	Appliance	MFE	Secondary	0.165	0.018	0.183	9	\$41.58
HVAC Controls	HVAC	Control	MFE	MOI	0.429	0.001	0.430	12	\$118.69
Rooftop or split system SEER 15	HVAC	Home	MFE	MOI	0.429	0.001	0.430	15	\$376.04
Rooftop or split system SEER 18	HVAC	Home	MFE	MOI	0.429	0.001	0.430	15	\$941.68
Ductless Air Conditioning including VRF & Split Systems	HVAC	Per Home	MFE	ET	0.429	0.000	0.429	15	\$1,130.00
Evaporative Cooling (Swamp Cooler)	HVAC	Per Home	MFE	ET	0.379	0.050	0.429	15	\$3,343.17
Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)	HVAC	Per Home	MFE	ET	0.429	0.000	0.429	15	\$1,598.06
Residential HVAC for Hot-Dry Climates	HVAC	Per Unit	MFE	ET	0.429	0.000	0.429	15	\$746.00
Residential Water-Cooled Heat Exchangers for HVAC Equipment	HVAC	Per Home	MFE	ET	0.430	0.000	0.430	15	\$4,241.80
HVAC Quality Maintenance	HVAC	Per Home	MFE	ET	0.666	0.293	0.959	8	\$1,152.17
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.168	0.000	0.168	7	\$4.14
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.168	0.000	0.168	20	\$58.55
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	3.737	1.820	5.557	7	\$4.79
LED Lighting 60W Equiv -	Indoor	Lamp	MFE	ET	3.737	1.820	5.557	20	\$58.55

SDG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Indoor	Lighting								
CFL Fixture	Indoor Lighting	Fixture	MFE	HIM	0.537	0.832	1.370	16	\$53.41
Super T-8	Indoor Lighting	Lamp	MFE	MOI	2.908	0.000	2.908	5	\$2.79
Specialty CFLs	Indoor Lighting	Lamp	MFE	HIM	4.210	0.634	4.844	5	\$7.16
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	1.071	0.915	1.987	7	\$5.37
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	1.071	0.915	1.987	20	\$32.63
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.966	1.079	2.045	7	\$5.95
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.966	1.079	2.045	20	\$42.70
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	MFE	HIM	0.084	0.176	0.260	7	\$7.52
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	MFE	ET	0.084	0.176	0.260	20	\$50.76
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.015	0.005	0.020	20	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	MFE	ET	0.020	0.005	0.025	20	\$44.38
LED: Recessed Fixtures	Indoor Lighting	Lamp	MFE	ET	0.050	0.005	0.055	20	\$44.00
ES Clothes Washer	Laundry	Appliance	MFE	HIM	0.185	0.023	0.209	12	\$105.33
LED Holiday Lights (300 bulb string)	Outdoor Lighting	String	MFE	HIM	1.219	0.041	1.260	5	\$14.41
Efficient Set Top Box	Plug Loads	Box	MFE	MOI	0.760	0.000	0.760	5	\$19.02
ES LCD/Plasma TVs	Plug Loads	TV	MFE	MOI	0.000	0.000	0.480	5	\$85.99
Efficient Game Console	Plug Loads	Device	MFE	MOI	0.350	0.000	0.350	5	\$228.59
Heat Pump Water Heaters	Water Heating	Per Home	MFE	ET	0.069	0.001	0.070	10	\$1,100.00
Low Income	Low Income	Home	LI	Low Income	1.000	0.000	1.000	10	\$678.00



SDG&E Residential Electric - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
WB - NC - 15%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$300.00
WB - NC - 25%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$3,220.00
WB - NC - 30%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$5,414.00

**Table H-3: SDG&E Residential Gas Savings Measure Inputs**

SDG&E Residential Gas - Savings Measure Inputs						
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
ES Dishwasher	Appliance	Appliance	SFE	3.93	3.93	0.8
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	32.24	41.80	0.7
High perf window	Building Envelope	Home	SFE	36.67	36.67	0.6
High Efficiency Furnace	HVAC	Furnace	SFE	23.32	23.22	0.6
Duct sealing and insul	HVAC	Home	SFE	7.82	7.82	0.8
High Efficiency Space heating boiler	HVAC	Boiler	SFE	868.57	868.57	0.6
ES Clothes Washer	Laundry	Appliance	SFE	11.17	11.17	0.9
Other	Other	Home	SFE	0.09	0.09	1.0
Water heater controls on Boilers	Water Heating	Control	SFE	39.50	14.89	0.6
Low Flow Showerhead	Water Heating	Home	SFE	13.70	13.70	0.9
Faucet Aerator	Water Heating	Home	SFE	5.76	5.76	0.9
High Efficiency Pool Heater	Water Heating	Pool	SFE	47.81	47.81	0.8
High Efficiency Water heating boiler	Water Heating	Boiler	SFE	73.00	73.00	0.8
High Efficiency Water Heater	Water Heating	Unit	SFE	34.72	32.77	0.6
Condensing Gas Water Heater	Water Heating	Unit	SFE	49.88	49.88	1.0
ES Dishwasher	Appliance	Appliance	MFE	2.80	2.80	0.8
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	26.69	33.83	0.7
High perf window	Building Envelope	Home	MFE	18.02	18.02	0.6
High Efficiency Furnace	HVAC	Furnace	MFE	8.67	8.68	0.6
Duct sealing and insul	HVAC	Home	MFE	1.01	1.01	0.8
High Efficiency Space heating boiler	HVAC	Boiler	MFE	868.57	868.57	0.6
ES Clothes Washer	Laundry	Appliance	MFE	10.41	10.41	0.9
Water heater controls on Boilers	Water Heating	Control	MFE	39.50	14.89	0.6
Low Flow Showerhead	Water Heating	Home	MFE	13.70	13.70	0.9
Faucet Aerator	Water Heating	Home	MFE	5.76	5.76	0.9
High Efficiency Water heating boiler	Water Heating	Boiler	MFE	73.00	73.00	0.8
High Efficiency Water Heater	Water Heating	Unit	MFE	31.97	30.05	0.6
Condensing Gas Water Heater	Water Heating	Unit	MFE	46.85	46.85	1.0
Low Income	Low Income	Home	LI	21.00	21.00	1.0
WB - NC - 15%	Whole building	Home	RNC	77.63	77.63	0.8
WB - NC - 25%	Whole building	Home	RNC	150.70	150.70	0.8

SDG&E Residential Gas - Savings Measure Inputs						
Efficient Measure Name	DEER Category	Units	Building Type	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
WB - NC - 30%	Whole building	Home	RNC	199.47	199.47	0.8

**Table H-4: SDG&E Residential Gas - Density and Cost Measure Inputs**

SDG&E Residential Gas - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Category	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
ES Dishwasher	Appliance	Appliance	SFE	Appliance	0.668	0.009	0.677	11	\$211.47
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	SFE	Home	0.380	0.466	0.846	20	\$1,770.96
High perf window	Building Envelope	Home	SFE	Home	0.317	0.529	0.846	20	\$2,569.25
High Efficiency Furnace	HVAC	Furnace	SFE	Furnace	0.840	0.006	0.846	20	\$463.51
Duct sealing and insul	HVAC	Home	SFE	Home	0.632	0.214	0.846	18	\$282.97
High Efficiency Space heating boiler	HVAC	Boiler	SFE	Boiler	0.000	0.000	0.000	20	\$297.85
ES Clothes Washer	Laundry	Appliance	SFE	Appliance	0.608	0.261	0.869	11	\$475.18
Other	Other	Home	SFE	Home	1.000	0.000	1.000	20	\$0.90
Water heater controls on Boilers	Water Heating	Control	SFE	Control	0.000	0.000	0.000	10	\$17.52
Low Flow Showerhead	Water Heating	Home	SFE	Home	0.188	0.696	0.884	10	\$31.65
Faucet Aerator	Water Heating	Home	SFE	Home	0.361	0.523	0.884	10	\$9.50
High Efficiency Pool Heater	Water Heating	Pool	SFE	Pool	0.061	0.000	0.061	10	\$794.00
High Efficiency Water heating boiler	Water Heating	Boiler	SFE	Boiler	0.000	0.000	0.000	20	\$297.85
High Efficiency Water Heater	Water Heating	Unit	SFE	Unit	0.811	0.073	0.884	11	\$142.90
Condensing Gas Water Heater	Water Heating	Unit	SFE	Unit	0.830	0.000	0.830	15	\$604.00
ES Dishwasher	Appliance	Appliance	MFE	HIM	0.371	0.003	0.374	11	\$211.47
Insulation - Ceiling R30, Wall R13	Building Envelope	Home	MFE	HIM	0.205	0.280	0.485	20	\$1,003.47
High perf window	Building Envelope	Home	MFE	Secondary	0.283	0.202	0.485	20	\$1,262.52
High Efficiency Furnace	HVAC	Furnace	MFE	HIM	0.483	0.002	0.485	20	\$463.51
Duct sealing and insul	HVAC	Home	MFE	HIM	0.401	0.084	0.485	18	\$282.97
High Efficiency Space heating boiler	HVAC	Boiler	MFE	HIM	0.049	0.001	0.050	20	\$297.85
ES Clothes Washer	Laundry	Appliance	MFE	HIM	0.590	0.074	0.664	11	\$475.18
Water heater controls on Boilers	Water Heating	Control	MFE	HIM	0.009	0.004	0.013	10	\$17.52
Low Flow Showerhead	Water	Home	MFE	HIM	0.142	0.527	0.669	10	\$31.65

SDG&E Residential Gas - Density and Cost Measure Inputs									
Efficient Measure Name	DEER Category	Units	Building Type	Measure Category	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
	Heating								
Faucet Aerator	Water Heating	Home	MFE	HIM	0.273	0.396	0.669	10	\$9.50
High Efficiency Water heating boiler	Water Heating	Boiler	MFE	HIM	0.009	0.001	0.010	20	\$297.85
High Efficiency Water Heater	Water Heating	Unit	MFE	HIM	0.613	0.056	0.669	11	\$142.90
Condensing Gas Water Heater	Water Heating	Unit	MFE	ET	0.830	0.000	0.830	15	\$604.00
Low Income	Low Income	Home	LI	Low Income	1.000	0.000	1.000	10	\$380.00
WB - NC - 15%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$300.00
WB - NC - 25%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$1,985.00
WB - NC - 30%	Whole building	Home	RNC	MOI	1.000	0.000	1.000	20	\$2,971.00

**Table H-5: SDG&E Commercial Electric - Savings Measure Inputs**

SDG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Window film	Building Envelope	Sq. Ft.	5.15	5.15	1.2004	1.2004	0.85
Cool Roof	Building Envelope	Sq. Ft.	0.14	0.14	0.0000	0.0000	0.7
PS Exterior HID - Incandescent Base > 150W	Exterior Lighting	Fixture	295.99	295.99	0.1255	0.1255	0.77
PS Exterior HID - Incandescent Base <= 150W	Exterior Lighting	Fixture	519.60	519.60	0.0589	0.0589	0.77
PS Exterior HID - Mercury Vapor Base	Exterior Lighting	Fixture	370.14	370.14	0.1282	0.1282	0.77
Lighting Controls - Photocell	Exterior Lighting	Photocell	262.80	262.80	0.0016	0.0016	0.81
Lighting Controls - Timeclock	Exterior Lighting	Timeclock	262.80	262.80	0.0016	0.0016	0.81
LED Outdoor Street/Area Lighting	Exterior Lighting	Fixture	633.00	633.00	0.0445	0.0445	0.85
Convection Oven	Food Service	Oven	1879.00	1879.00	0.2288	0.2288	0.7
HE Fryer	Food Service	Fryer	1166.00	1166.00	0.1544	0.1544	0.7
Refrigerator Glass Doors	Food Service	Refrigerator	1622.00	1622.00	0.1201	0.1201	0.7
HE Griddle	Food Service	Griddle	1886.00	1886.00	0.2121	0.2121	0.7
Food Holding Cabinet	Food Service	Holding Cab	9307.50	9307.50	0.1826	0.1826	0.7
HE Ice Maker	Food Service	Ice Maker	1197.10	1197.10	0.2740	0.2740	0.7
Combination Oven	Food Service	Oven	18431.00	18431.00	0.2051	0.2051	0.7
Solid Door Reach-in Freezer	Food Service	Freezer	1201.00	1201.00	0.1203	0.1203	0.7
Solid Door Reach-in Refrigerator	Food Service	Refrigerator	650.00	650.00	0.1203	0.1203	0.7
Pressureless Steamer	Food Service	Steamer	11070.00	11070.00	0.1925	0.1925	0.7
Retro commissioning	HVAC	HP	476.00	476.00	0.5938	0.5938	0.7
High Efficiency Centrifugal Chiller	HVAC	Tons	180.49	180.49	0.4387	0.4387	0.64
High Efficiency Reciprocating Chiller	HVAC	Tons	193.06	193.06	0.4781	0.4781	0.64
VSD Chiller Water Loop Pumps	HVAC	HP	405.17	405.17	0.6179	0.6179	0.85
HVAC controls	HVAC	Control	35.91	35.91	0.2591	0.2591	0.85
EMS	HVAC	Control	1900.00	1900.00	0.1053	0.1053	0.85
VFD - HVAC 10-25 HP	HVAC	HP	752.58	752.58	0.2230	0.2230	0.75
VFD - HVAC Fan 22-49 HP	HVAC	HP	730.00	730.00	0.0000	0.0003	0.75
VFD - HVAC Fan 50-100 HP	HVAC	HP	592.46	592.46	0.0000	0.0003	0.75
Packaged A/C (>=65k 12 EER)	HVAC	Tons	154.10	154.10	0.5760	0.5760	0.7

SDG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Packaged A/C (<65k 15 SEER)	HVAC	Tons	256.28	256.28	0.2265	0.2265	0.7
Demand Controlled Ventilation	HVAC	Control	105.28	105.28	1.3393	1.3393	0.85
Economizer adjustment	HVAC	Tons	105.28	105.28	0.5623	0.5623	0.85
Add economizer	HVAC	Tons	250.74	250.74	0.0000	0.0000	0.85
Evaporative Cooler	HVAC	Tons	1105.48	1105.48	0.5429	0.5429	0.7
Packaged Terminal A/C	HVAC	Tons	121.14	121.14	0.7031	0.7031	0.7
Packaged Terminal Heat Pump	HVAC	Tons	121.71	121.71	0.7002	0.7002	0.7
Fault Detection & Diagnostics	HVAC	Tons	357.00	357.00	0.5625	0.5625	0.85
Variable Refrigerant Flow (VRF) Chiller	HVAC	Tons	99.00	99.00	0.5000	0.5000	0.85
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	HVAC	Tons	147.75	147.75	0.0002	0.0002	0.5
High Performance Rooftop Unit	HVAC	Tons	1963.50	1963.50	0.2265	0.2265	0.7
Occupancy Sensor - Motion	Indoor Lighting	Sensor	169.81	169.81	0.2182	0.2182	0.84
High bay fluorescent	Indoor Lighting	Fixture	435.77	435.77	0.2176	0.2176	0.85
PS Interior HID - Incandescent Base > 150W	Indoor Lighting	Fixture	317.50	317.50	0.2034	0.2034	0.77
PS Interior HID - Incandescent Base <= 150W	Indoor Lighting	Fixture	638.02	638.02	0.1957	0.1957	0.77
PS Interior HID - Mercury Vapor Base	Indoor Lighting	Fixture	415.39	415.39	0.2090	0.2090	0.77
LED Exit sign	Indoor Lighting	Fixture	306.66	306.66	0.1335	0.1335	0.85
CFL Fixture Under 15W	Indoor Lighting	Fixture	170.41	170.41	0.2045	0.2045	0.85
CFL Fixture 16 to 24W	Indoor Lighting	Fixture	208.13	208.13	0.2144	0.2144	0.85
CFL Fixture Over 24W	Indoor Lighting	Fixture	359.47	359.47	0.2061	0.2061	0.85
Daylighting w/dimmable ballast	Indoor Lighting	Fixture	92.51	92.51	0.2606	0.2606	0.5
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	49.99	64.17	0.1780	0.1914	0.85
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	49.99	64.17	0.1780	0.1914	0.85
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	91.64	119.17	0.1779	0.1914	0.85
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	91.64	119.17	0.1779	0.1914	0.85
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	127.75	165.01	0.1785	0.1914	0.85
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	127.75	165.01	0.1785	0.1914	0.85

SDG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	161.07	210.84	0.1782	0.1914	0.85
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	161.07	210.84	0.1782	0.1914	0.85
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	210.36	275.01	0.1835	0.1914	0.85
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	210.36	275.01	0.1835	0.1914	0.85
Advanced Generation T8 - 4ft	Indoor Lighting	Fixture	120.36	120.36	0.2441	0.2441	0.85
LED Lighting T8 - 4ft Equiv	Indoor Lighting	Fixture	120.36	120.36	0.2441	0.2441	0.85
Advanced Generation T8 - 8ft	Indoor Lighting	Fixture	54.80	54.80	0.1825	0.1825	0.85
LED Lighting T8 - 8ft Equiv	Indoor Lighting	Fixture	54.80	54.80	0.1825	0.1825	0.85
T12 to T8 - 4ft	Indoor Lighting	Fixture	81.23	81.23	0.1538	0.1538	0.85
T12 to T8 - 8ft	Indoor Lighting	Fixture	45.73	50.52	0.1890	0.2428	0.85
Linear fluorescent delamping 4 ft	Indoor Lighting	Fixture	183.11	250.22	0.2113	0.2453	0.85
Linear fluorescent delamping 8 ft	Indoor Lighting	Fixture	261.21	465.53	0.2115	0.2453	0.85
20W BT-5 Ceramic Metal Halide	Indoor Lighting	Fixture	53.77	53.77	0.2046	0.2046	0.85
Dimmable w/F32T8 & 5W standby CFL lamps	Indoor Lighting	Fixture	173.00	173.00	0.0867	0.0867	0.85
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	48.00	48.00	0.1604	0.1604	0.77
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	84.00	84.00	0.1558	0.1558	0.77
LED: PAR 20	Indoor Lighting	Lamp	89.00	89.00	0.1557	0.1557	0.77
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	129.00	129.00	0.1552	0.1552	0.77
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	145.00	145.00	0.1540	0.1540	0.77
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	155.00	155.00	0.1540	0.1540	0.77
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	184.00	184.00	0.1548	0.1548	0.77
LED: Recessed Fixtures	Indoor Lighting	Lamp	197.00	197.00	0.1524	0.1524	0.77
High Efficiency Clothes Washer	Laundry	Clothes Washer	502.03	502.03	0.1466	0.1466	0
Other	Other	1,000 SqFt	1000.00	1000.00	0.0000	0.0000	1
Occupancy Sensor - Plug Load	Plug Load	Sensor	143.00	143.00	0.3566	0.3566	0.7

SDG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
Computer Power Supply	Plug Load	Computer	81.00	81.00	0.2242	0.2242	0.7
Vending Machine Controller - Non-Refrigerated	Plug Load	Vending Machine	363.58	363.58	0.2082	0.2082	0.7
Vending Machine Controller - Refrigerated	Plug Load	Vending Machine	1511.48	1511.48	0.2109	0.2109	0.7
Energy Star TV	Plug Load	TV	28.93	28.93	0.1144	0.1144	0.7
Improved Data Center Design	Plug Load	Power Supply	5686848.01	5686848.01	0.1142	0.1142	0.85
Improved Air-Flow Management	Plug Load	Power Supply	1023632.64	1023632.64	0.1142	0.1142	0.85
Variable-Speed CRAC Compressors	Plug Load	Power Supply	2416910.40	2416910.40	0.1142	0.1142	0.85
Strip Curtain for Walkins	Refrigeration	Sq. Ft.	174.06	174.06	0.1869	0.1869	0.46
Door Gaskets for Walk-in Freezers and Coolers	Refrigeration	Ln. Ft.	19.74	19.74	0.1846	0.1846	0.76
Auto Closer for Glass Door Walkin	Refrigeration	Control	2651.00	2651.00	0.0000	0.0000	0.7
Auto Closer for Solid Door Walkin	Refrigeration	Control	4849.00	4849.00	0.0000	0.0000	0.7
Night Covers - LowTemp Coffin Cases	Refrigeration	Ln. Ft.	22.83	22.83	0.0000	0.0000	0.7
Night Covers - MedTemp Vertical Cases	Refrigeration	Ln. Ft.	34.09	34.09	0.0000	0.0000	0.7
Evaporative Fan ECM Motor	Refrigeration	Motor	673.00	673.00	0.1142	0.1142	0.7
Evaporative Fan Controller for Walkins	Refrigeration	Control	779.00	779.00	0.0591	0.0591	0.7
Anti-Sweat Heater Controls	Refrigeration	Ln. Ft.	883.50	883.50	0.1061	0.1061	0.7
Open Multi-Deck to New High Eff Glass Door Reachins	Refrigeration	Ln. Ft.	967.69	967.69	0.1467	0.1467	0.7
New High Eff LowTemp No ASH Glass Door Case	Refrigeration	Ln. Ft.	510.82	510.82	0.1390	0.1390	0.7
Energy Efficient Air Cooled Condenser	Refrigeration	Tons	1452.03	1452.03	0.1260	0.1260	0.7
Energy Efficient Evaporative Cooled Condenser	Refrigeration	Tons	1636.47	1636.47	0.1312	0.1312	0.7
Multiplex Air Cooled with FHP (fixed setpoint)	Refrigeration	Tons	837.00	837.00	0.1244	0.1244	0.7
Multiplex Evaporative Cooled with FHP (fixed setpoint)	Refrigeration	Tons	1634.00	1634.00	0.1322	0.1322	0.7
Suction Line Insulation	Refrigeration	Ln. Ft.	11.37	11.37	0.1864	0.1864	0.7
Single Compressor to Multiplex Air Cooled System	Refrigeration	Tons	226.80	226.80	0.1275	0.1275	0.7
Single Compressor to Multiplex Evaporative Cooled System	Refrigeration	Tons	543.16	543.16	0.1286	0.1286	0.7
Server Virtualization	Whole building	Server	1273.48	1273.48	0.1142	0.1142	0.7
WB - NC - 15%	Whole building	1,000 SqFt	1781.72	1781.72	0.0000	0.0000	0.8



SDG&E Commercial Electric - Savings Measure Inputs							
Efficient Measure Name	DEER Category	Units	Ex Ante kWh/Unit Savings	Ex Post kWh/Unit Savings	Ex Ante Peak W/kWh Ratio	Ex Post Peak W/kWh Ratio	NTG
WB - NC - 25%	Whole building	1,000 SqFt	2487.83	2487.83	5.2190	5.2190	0.8

**Table H-6: SDG&E Commercial Electric – Density and Cost Measure Inputs**

SDG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Window film	Building Envelope	Sq. Ft.	MOI	36.67	1.32	37.99	10	\$3.12
Cool Roof	Building Envelope	Sq. Ft.	Secondary	665.86	4.95	670.81	15	\$0.45
PS Exterior HID - Incandescent Base > 150W	Exterior Lighting	Fixture	Secondary	0.16	0.00	0.16	15	\$287.00
PS Exterior HID - Incandescent Base <= 150W	Exterior Lighting	Fixture	Secondary	0.02	0.00	0.02	15	\$214.00
PS Exterior HID - Mercury Vapor Base	Exterior Lighting	Fixture	Secondary	0.17	0.00	0.17	15	\$287.00
Lighting Controls - Photocell	Exterior Lighting	Photocell	Secondary	0.51	0.26	0.77	8	\$122.11
Lighting Controls - Timeclock	Exterior Lighting	Timeclock	Secondary	0.48	0.28	0.77	8	\$122.11
LED Outdoor Street/Area Lighting	Exterior Lighting	Fixture	ET	0.17	0.02	0.19	12	\$946.71
Convection Oven	Food Service	Oven	Secondary	0.00	0.00	0.00	12	\$228.00
HE Fryer	Food Service	Fryer	Secondary	0.00	0.00	0.00	12	\$1,112.00
Refrigerator Glass Doors	Food Service	Refrigerator	Secondary	0.00	0.00	0.00	12	\$2,792.00
HE Griddle	Food Service	Griddle	Secondary	0.00	0.00	0.00	12	\$774.00
Food Holding Cabinet	Food Service	Holding Cab	Secondary	0.00	0.00	0.00	12	\$1,200.00
HE Ice Maker	Food Service	Ice Maker	Secondary	0.00	0.00	0.00	12	\$140.00
Combination Oven	Food Service	Oven	Secondary	0.00	0.00	0.00	12	\$3,824.00
Solid Door Reach-in Freezer	Food Service	Freezer	Secondary	0.00	0.00	0.00	12	\$747.00
Solid Door Reach-in Refrigerator	Food Service	Refrigerator	Secondary	0.00	0.00	0.00	12	\$1,825.00
Pressureless Steamer	Food Service	Steamer	Secondary	0.00	0.00	0.00	12	\$2,490.00
Retro commissioning	HVAC	HP	HIM	0.98	0.02	1.00	5	\$199.73
High Efficiency Centrifugal Chiller	HVAC	Tons	HIM	0.76	0.01	0.77	20	\$176.93
High Efficiency Reciprocating Chiller	HVAC	Tons	HIM	0.75	0.02	0.77	20	\$40.00
VSD Chiller Water Loop Pumps	HVAC	HP	HIM	0.26	0.01	0.27	15	\$380.26
HVAC controls	HVAC	Control	HIM	0.30	0.70	1.00	11	\$507.58

SDG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
EMS	HVAC	Control	HIM	0.04	0.02	0.06	15	\$1,000.00
VFD - HVAC 10-25 HP	HVAC	HP	HIM	0.47	0.03	0.50	15	\$388.93
VFD - HVAC Fan 22-49 HP	HVAC	HP	HIM	0.36	0.02	0.37	15	\$284.15
VFD - HVAC Fan 50-100 HP	HVAC	HP	HIM	0.38	0.00	0.38	15	\$151.80
Packaged A/C (>=65k 12 EER)	HVAC	Tons	HIM	0.54	0.00	0.54	15	\$77.96
Packaged A/C (<65k 15 SEER)	HVAC	Tons	HIM	0.58	0.00	0.58	15	\$113.10
Demand Controlled Ventilation	HVAC	Control	Secondary	0.90	0.10	1.00	13	\$980.00
Economizer adjustment	HVAC	Tons	MOI	0.04	0.73	0.77	5	\$73.65
Add economizer	HVAC	Tons	MOI	0.15	0.62	0.77	10	\$155.01
Evaporative Cooler	HVAC	Tons	MOI	0.03	0.56	0.58	15	\$104.79
Packaged Terminal A/C	HVAC	Tons	Secondary	0.19	0.00	0.19	15	\$44.00
Packaged Terminal Heat Pump	HVAC	Tons	Secondary	0.19	0.00	0.19	15	\$135.00
Fault Detection & Diagnostics	HVAC	Tons	ET	0.69	0.08	0.77	15	\$327.00
Variable Refrigerant Flow (VRF) Chiller	HVAC	Tons	ET	0.76	0.01	0.77	15	\$30.00
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	HVAC	Tons	ET	0.59	0.18	0.77	10	\$50.00
High Performance Rooftop Unit	HVAC	Tons	ET	0.58	0.00	0.58	15	\$866.51
Occupancy Sensor - Motion	Indoor Lighting	Sensor	HIM	1.92	0.05	1.97	8	\$77.00
High bay fluorescent	Indoor Lighting	Fixture	HIM	0.60	0.40	1.00	13	\$360.00
PS Interior HID - Incandescent Base > 150W	Indoor Lighting	Fixture	HIM	0.16	0.00	0.16	15	\$287.00
PS Interior HID - Incandescent Base <= 150W	Indoor Lighting	Fixture	HIM	0.02	0.00	0.02	15	\$214.00
PS Interior HID - Mercury Vapor Base	Indoor Lighting	Fixture	HIM	0.17	0.00	0.17	15	\$227.00
LED Exit sign	Indoor Lighting	Fixture	Secondary	0.23	0.19	0.42	16	\$57.75
CFL Fixture Under 15W	Indoor Lighting	Fixture	Secondary	0.41	0.23	0.65	13	\$45.00
CFL Fixture 16 to 24W	Indoor Lighting	Fixture	Secondary	0.15	0.18	0.34	13	\$49.00
CFL Fixture Over 24W	Indoor Lighting	Fixture	Secondary	0.11	0.20	0.30	13	\$51.00
Daylighting w/dimmable ballast	Indoor Lighting	Fixture	MOI	0.74	0.00	0.74	8	\$180.00
CFL: <=7W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.31	0.21	0.52	5	\$10.03
LED Lighting 40W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.31	0.21	0.52	20	\$16.12

SDG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
CFL: 13W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.31	0.21	0.52	5	\$10.68
LED Lighting 60W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.31	0.21	0.52	20	\$24.18
CFL: 18W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.19	0.18	0.37	5	\$11.26
LED Lighting 75W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.19	0.18	0.37	20	\$30.23
CFL: 23W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.19	0.18	0.37	5	\$11.84
LED Lighting 100W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.19	0.18	0.37	20	\$40.30
CFL: >25W Screw-In Indoor	Indoor Lighting	Lamp	HIM	0.09	0.19	0.28	5	\$13.41
LED Lighting 120W Equiv - Indoor	Indoor Lighting	Lamp	ET	0.09	0.19	0.28	20	\$48.36
Advanced Generation T8 - 4ft	Indoor Lighting	Fixture	MOI	9.05	0.00	9.05	5	\$40.00
LED Lighting T8 - 4ft Equiv	Indoor Lighting	Fixture	ET	9.05	0.00	9.05	20	\$164.67
Advanced Generation T8 - 8ft	Indoor Lighting	Fixture	HIM	1.19	0.05	1.24	5	\$13.36
LED Lighting T8 - 8ft Equiv	Indoor Lighting	Fixture	ET	1.19	0.05	1.24	20	\$329.34
T12 to T8 - 4ft	Indoor Lighting	Fixture	HIM	3.16	5.88	9.05	5	\$36.00
T12 to T8 - 8ft	Indoor Lighting	Fixture	HIM	1.08	0.16	1.24	5	\$38.81
Linear fluorescent delamping 4 ft	Indoor Lighting	Fixture	HIM	5.61	0.00	5.61	15	\$60.00
Linear fluorescent delamping 8 ft	Indoor Lighting	Fixture	HIM	1.83	0.00	1.83	15	\$71.00
20W BT-5 Ceramic Metal Halide	Indoor Lighting	Fixture	ET	2.02	0.02	2.05	3	\$220.95
Dimmable w/F32T8 & 5W standby CFL lamps	Indoor Lighting	Fixture	ET	7.14	0.79	7.94	3	\$110.00
LED: MR 16 (20W Baseline)	Indoor Lighting	Lamp	ET	0.03	0.01	0.04	12	\$16.67
LED: MR 16 (35W Baseline)	Indoor Lighting	Lamp	ET	0.03	0.01	0.04	12	\$14.37
LED: PAR 20	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	11	\$24.38
LED: PAR 30 (45-55W Baseline)	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	9	\$37.65
LED: PAR 30 (60-70W Baseline)	Indoor Lighting	Lamp	ET	0.01	0.01	0.02	12	\$37.65
LED: PAR 38 (50-65W Baseline)	Indoor Lighting	Lamp	ET	0.02	0.01	0.02	10	\$44.38
LED: PAR 38 (70-90W Baseline)	Indoor Lighting	Lamp	ET	0.02	0.01	0.02	12	\$44.38

SDG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
LED: Recessed Fixtures	Indoor Lighting	Lamp	ET	0.01	0.00	0.01	15	\$44.00
High Efficiency Clothes Washer	Laundry	Clothes Washer	Secondary	0.09	0.00	0.09	11	\$259.01
Other	Other	1,000 SqFt	Secondary	0.02	0.00	0.02	20	\$1,000.00
Occupancy Sensor - Plug Load	Plug Load	Sensor	Secondary	2.37	0.00	2.37	8	\$82.25
Computer Power Supply	Plug Load	Computer	Secondary	1.53	0.03	1.56	4	\$5.00
Vending Machine Controller - Non-Refrigerated	Plug Load	Vending Machine	Secondary	0.05	0.00	0.05	5	\$108.00
Vending Machine Controller - Refrigerated	Plug Load	Vending Machine	Secondary	0.06	0.00	0.06	5	\$216.00
Energy Star TV	Plug Load	TV	MOI	0.08	0.08	0.15	5	\$85.99
Improved Data Center Design	Plug Load	Power Supply	ET	0.00	0.00	0.00	10	\$1,137,435
Improved Air-Flow Management	Plug Load	Power Supply	ET	0.00	0.00	0.00	10	\$143,387
Variable-Speed CRAC Compressors	Plug Load	Power Supply	ET	0.00	0.00	0.00	10	\$483,410
Strip Curtain for Walkins	Refrigeration	Sq. Ft.	HIM	1.68	0.10	1.78	4	\$10.22
Door Gaskets for Walk-in Freezers and Coolers	Refrigeration	Ln. Ft.	HIM	0.45	0.03	0.48	4	\$9.61
Auto Closer for Glass Door Walkin	Refrigeration	Control	Secondary	0.04	0.00	0.05	8	\$470.04
Auto Closer for Solid Door Walkin	Refrigeration	Control	Secondary	0.08	0.01	0.09	8	\$470.04
Night Covers - LowTemp Coffin Cases	Refrigeration	Ln. Ft.	Secondary	0.39	0.00	0.40	5	\$42.20
Night Covers - MedTemp Vertical Cases	Refrigeration	Ln. Ft.	Secondary	0.22	0.00	0.22	5	\$42.20
Evaporative Fan ECM Motor	Refrigeration	Motor	Secondary	1.06	0.00	1.06	15	\$230.94
Evaporative Fan Controller for Walkins	Refrigeration	Control	ET	0.07	0.00	0.07	16	\$69.69
Anti-Sweat Heater Controls	Refrigeration	Ln. Ft.	Secondary	0.77	0.02	0.79	12	\$968.23
Open Multi-Deck to New High Eff Glass Door Reachins	Refrigeration	Ln. Ft.	HIM	0.13	0.00	0.13	12	\$554.93
New High Eff LowTemp No ASH Glass Door Case	Refrigeration	Ln. Ft.	HIM	0.30	0.00	0.31	12	\$515.58
Energy Efficient Air Cooled Condenser	Refrigeration	Tons	Secondary	0.45	0.00	0.45	15	\$559.00
Energy Efficient Evaporative Cooled Condenser	Refrigeration	Tons	Secondary	0.19	0.00	0.19	15	\$559.00
Multiplex Air Cooled with FHP (fixed setpoint)	Refrigeration	Tons	Secondary	0.45	0.00	0.45	15	\$279.00
Multiplex Evaporative Cooled with FHP (fixed setpoint)	Refrigeration	Tons	Secondary	0.19	0.00	0.19	15	\$279.00
Suction Line Insulation	Refrigeration	Ln. Ft.	Secondary	1.15	0.02	1.17	11	\$1.72

SDG&E Commercial Electric – Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Single Compressor to Multiplex Air Cooled System	Refrigeration	Tons	Secondary	0.79	0.00	0.79	15	\$3,120.43
Single Compressor to Multiplex Evaporative Cooled System	Refrigeration	Tons	Secondary	0.13	0.00	0.13	15	\$2,905.13
Server Virtualization	Whole building	Server	Secondary	0.04	0.13	0.18	10	\$1,400.00
WB - NC - 15%	Whole building	1,000 SqFt	MOI	1.00	0.00	1.00	15	\$10.00
WB - NC - 25%	Whole building	1,000 SqFt	MOI	1.00	0.00	1.00	15	\$326.73

**Table H-7: SDG&E Commercial Gas Savings Measure Inputs**

SDG&E Commercial Gas - Savings Measure Inputs					
Efficient Measure Name	DEER Category	Units	Ex Ante Therms/Unit	Ex Post Therms/Unit	NTG
Convection Oven	Food Service	Oven	306.00	306.00	0.80
HE Fryer	Food Service	Fryer	505.00	505.00	0.80
HE Griddle	Food Service	Griddle	149.00	149.00	0.80
Combination Oven	Food Service	Oven	403.00	403.00	0.80
Pressureless Steamer	Food Service	Steamer	247.00	247.00	0.80
Replacing leaking steam traps	HVAC	Traps	46.00	46.00	0.80
Space Heating Boiler 85% Efficient	HVAC	kBtuh	1.33	1.33	0.80
Space Heating Boiler 95% Efficient	HVAC	kBtuh	0.27	3.03	0.80
Gas Furnace AFUE 92	HVAC	kBtuh	0.14	0.14	0.80
Gas Furnace AFUE 94	HVAC	kBtuh	0.16	0.16	0.80
Retrocommissioning	HVAC	kBtuh	17.79	17.79	0.80
HVAC Controls	HVAC	Control	4.45	4.45	0.96
Fume Hood Controls	HVAC	Fume Hood	870.42	388.50	0.96
EMS	HVAC	Measure Floor Area	807.58	807.58	0.96
Automatic Steam Trap Monitoring	HVAC	Per Steam Trap	345.00	345.00	1.00
Horizontal Axis Clothes Washer	Laundry	Clothes Washer	78.36	78.36	0.96
Other	Other	1,000 SqFt	1.00	1.00	1.00
Water Heating Boiler 85% Efficient	Water Heating	kBtuh	0.51	0.51	0.96
Water Heating Boiler 95% Efficient	Water Heating	kBtuh	2.12	2.12	0.96
Instantaneous Water Heater	Water Heating	Water heater	199.25	205.62	0.96
Storage Water Heater (EF>=.86)	Water Heating	Water heater	89.39	95.45	0.96
Pool Heater - 84% or more efficient	Water Heating	kBtuh	2.78	2.78	0.96
Pipe and Tank Insulation	Water Heating	Sqft	7.64	7.64	0.96
WB - NC - 15%	Whole building	1,000 SqFt	24.45	24.45	0.80
WB - NC - 25%	Whole building	1,000 SqFt	35.64	35.64	0.80

**Table H-8: SDG&E Commercial Gas - Density and Cost Measure Inputs**

PG&E Commercial Gas - Density and Cost Measure Inputs								
Efficient Measure Name	DEER Category	Units	Measure Classification	Base Density	Efficient Density	Total Density	Measure Life	Measure Cost
Convection Oven	Food Service	Oven	HIM	0.025	0.000	0.025	12	\$426.00
HE Fryer	Food Service	Fryer	HIM	0.019	0.000	0.019	12	\$1,304.00
HE Griddle	Food Service	Griddle	HIM	0.020	0.000	0.020	12	\$857.00
Combination Oven	Food Service	Oven	HIM	0.059	0.000	0.060	12	\$5,717.00
Pressureless Steamer	Food Service	Steamer	HIM	0.015	0.000	0.015	12	\$3,732.60
Replacing leaking steam traps	HVAC	Traps	HIM	0.090	0.010	0.100	6	\$185.52
Space Heating Boiler 85% Efficient	HVAC	kBtuh	HIM	12.906	0.122	13.029	20	\$3.29
Space Heating Boiler 95% Efficient	HVAC	kBtuh	HIM	12.646	0.000	12.646	20	\$4.93
Gas Furnace AFUE 92	HVAC	kBtuh	Secondary	4.170	0.001	4.172	20	\$7.52
Gas Furnace AFUE 94	HVAC	kBtuh	Secondary	4.172	0.000	4.172	20	\$8.46
Retrocommissioning	HVAC	kBtuh	HIM	0.989	0.011	1.000	5	\$4.57
HVAC Controls	HVAC	Control	HIM	0.300	0.700	1.000	11	\$507.58
Fume Hood Controls	HVAC	Fume Hood	Secondary	0.014	0.018	0.032	13	\$4,000.00
EMS	HVAC	Measure Floor Area	MOI	0.042	0.018	0.060	15	\$507.58
Automatic Steam Trap Monitoring	HVAC	Per Steam Trap	ET	0.090	0.010	0.100	15	\$1,118.50
Horizontal Axis Clothes Washer	Laundry	Clothes Washer	Secondary	0.085	0.000	0.086	11	\$259.01
Other	Other	1,000 SqFt	Secondary	0.017	0.000	0.017	20	\$10.00
Water Heating Boiler 85% Efficient	Water Heating	kBtuh	Secondary	12.926	0.000	13.013	20	\$3.36
Water Heating Boiler 95% Efficient	Water Heating	kBtuh	Secondary	11.442	0.000	11.445	20	\$3.36
Instantaneous Water Heater	Water Heating	Water heater	Secondary	0.021	0.000	0.021	20	\$164.42
Storage Water Heater (EF>=.86)	Water Heating	Water heater	Secondary	0.029	0.000	0.029	15	\$176.85
Pool Heater - 84% or more efficient	Water Heating	kBtuh	Secondary	1.634	0.001	1.635	5	\$2.00
Pipe and Tank Insulation	Water Heating	Sqft	HIM	2.461	0.013	2.473	18	\$10.10
WB - NC - 15%	Whole building	1,000 SqFt	MOI	1.000	0.000	1.000	15	\$10.00
WB - NC - 25%	Whole building	1,000 SqFt	MOI	1.000	0.000	1.000	15	\$326.73





## Appendix I – Statewide Industrial Measure Level Inputs

This appendix contains the measure inputs for the Industrial sector. Industrial measure inputs are the same statewide and are separated into two tables, one for electric measures and one for gas. The tables contains the measure name, end use, applicability factor, base density, efficient density, total density, kWh savings (electric), therms savings (gas), cost, and measure life.

### Statewide Industrial Electric Measure Inputs

**Table I-1: Statewide Industrial Electric Measure Inputs**

Statewide Industrial Electric Measure Inputs									
*Units for all measures are in kWh*									
Measure Name	End Use	Applicability	Base Density	Efficient Density	Total Density	kWh/ Unit Savings	Watts /kWh Ratio	Cost/ Unit	EUL
CFL_Hardwired_Modular_36W	Lighting	0.55%	0.00	0.00	0.00	270.87	0.187	\$57.15	4
Energy_Star_Transformers_Lighting	Lighting	0.06%	1.00	0.00	1.00	0.20	0.187	\$0.01	20
Metal_Halide_50W	Lighting	0.08%	0.00	0.00	0.00	218.20	0.187	\$280.15	5
Occupancy_Sensor_4L4_Fluorescent_Fixtures	Lighting	1.35%	0.00	0.00	0.00	54.68	0.187	\$13.83	9
RET_2L4_Premium_T8_1EB	Lighting	6.29%	0.00	0.00	0.00	85.92	0.187	\$34.40	15
Energy_Star_Transformers_Other	Other	0.03%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Membranes_for_wastewater	Other	0.00%	1.00	0.00	1.00	0.10	0.187	\$0.00	15
Replace_V-belts_Other	Other	1.32%	1.00	0.00	1.00	0.00	0.187	\$0.00	5
Air_conveying_systems	Process	0.15%	1.00	0.00	1.00	0.41	0.187	\$0.04	14
Bakery_Process_(Mixing)_OM	Process	0.58%	1.00	0.00	1.00	0.10	0.187	\$0.01	10
Clean_Room_Controls	Process	0.87%	1.19	0.00	1.19	0.10	0.187	\$0.02	10
Clean_Room_New_Designs	Process	0.07%	1.00	0.00	1.00	0.30	0.187	\$0.13	10
Comp_Air_ASD_(100+_hp)	Process	5.80%	1.00	0.00	1.00	0.06	0.187	\$0.01	6
Comp_Air_ASD_(1-5_hp)	Process	0.47%	1.00	0.00	1.00	0.06	0.187	\$0.08	14
Comp_Air_ASD_(6-100_hp)	Process	3.49%	1.00	0.00	1.00	0.06	0.187	\$0.00	10
Comp_Air_Motor_practices-1_(100+_HP)	Process	5.80%	1.00	0.00	1.00	0.02	0.187	\$0.00	6
Comp_Air_Motor_practices-1_(1-5_HP)	Process	0.47%	1.00	0.00	1.00	0.05	0.187	\$0.02	14
Comp_Air_Motor_practices-1_(6-100_HP)	Process	3.49%	1.00	0.00	1.00	0.02	0.187	\$0.01	10
Comp_Air_Replace_100+_HP_motor	Process	1.61%	0.97	0.03	1.00	0.03	0.187	\$0.01	6
Comp_Air_Replace_1-5_HP_motor	Process	0.41%	1.00	0.00	1.00	0.06	0.187	\$0.05	14
Comp_Air_Replace_6-100_HP_motor	Process	1.54%	0.99	0.01	1.00	0.04	0.187	\$0.03	10
Compressed_Air_Controls	Process	2.45%	1.00	0.00	1.00	0.12	0.187	\$0.02	10
Compressed_Air_System_Optimization	Process	4.90%	1.00	0.00	1.00	0.20	0.187	\$0.02	10
Compressed_Air-OM	Process	7.35%	1.00	0.00	1.00	0.17	0.187	\$0.01	10

## Statewide Industrial Electric Measure Inputs

\*Units for all measures are in kWh\*

Measure Name	End Use	Applicability	Base Density	Efficient Density	Total Density	kWh/ Unit Savings	Watts /kWh Ratio	Cost/ Unit	EUL
Compressed_AirSizing	Process	3.93%	1.00	0.00	1.00	0.09	0.187	\$0.00	10
Direct_drive_Extruders	Process	0.06%	1.00	0.00	1.00	0.50	0.187	\$0.31	12
Drives_EE_motor	Process	1.93%	0.89	0.00	0.89	0.03	0.187	\$0.01	10
Drives_Optimization_process_(MT)	Process	0.29%	1.00	0.00	1.00	0.10	0.187	\$0.01	10
Drives_Process_Control	Process	0.14%	1.00	0.00	1.00	0.05	0.187	\$0.02	15
Drives_Process_Controls_(batch+_site)	Process	1.40%	1.00	0.00	1.00	0.05	0.187	\$0.02	10
Drives_Scheduling	Process	0.49%	1.00	0.00	1.00	0.05	0.187	\$0.01	10
Efficient_drives	Process	0.12%	1.00	0.00	1.00	0.04	0.187	\$0.01	10
Efficient_drives_rolling	Process	0.14%	1.00	0.00	1.00	0.06	0.187	\$0.01	10
Efficient_grinding	Process	0.31%	1.00	0.00	1.00	0.21	0.187	\$0.23	15
Efficient_Machinery	Process	0.03%	1.00	0.00	1.00	0.04	0.187	\$0.01	10
Efficient_practices_printing_press	Process	0.21%	1.00	0.00	1.00	0.10	0.187	\$0.01	20
Efficient_Printing_press_(fewer_cylinders)	Process	0.08%	1.00	0.00	1.00	0.20	0.187	\$0.06	10
Efficient_processes_(welding_etc.)	Process	0.55%	1.00	0.00	1.00	0.25	0.187	\$0.05	15
Energy_Star_Transformers_Comp_Air	Process	0.08%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Energy_Star_Transformers_Drives	Process	0.10%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Energy_Star_Transformers_Process	Process	0.01%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Energy_Star_Transformers_Pumps	Process	0.15%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Extruders_injection_Moulding-multipump	Process	0.23%	1.00	0.00	1.00	0.30	0.187	\$0.10	12
Gap_Forming_papermachine	Process	0.12%	1.00	0.00	1.00	0.08	0.187	\$0.01	20
High_Consistency_forming	Process	0.12%	1.00	0.00	1.00	0.08	0.187	\$0.01	20
Injection_Moulding_Direct_drive	Process	0.15%	1.00	0.00	1.00	0.20	0.187	\$0.10	12
Injection_Moulding_Impulse_Cooling	Process	0.15%	1.00	0.00	1.00	0.21	0.187	\$0.07	12
Light_cylinders	Process	0.08%	1.00	0.00	1.00	0.10	0.187	\$0.07	10
Machinery	Process	0.48%	0.66	0.00	0.66	0.05	0.187	\$0.01	10
New_transformers_welding	Process	0.13%	1.00	0.00	1.00	0.25	0.187	\$0.05	15
OM_drives_spinning_machines	Process	0.02%	1.00	0.00	1.00	0.16	0.187	\$0.03	10
OM_Extruders_Injection_Moulding	Process	0.58%	1.00	0.00	1.00	0.10	0.187	\$0.01	12
Optimization_control_PM	Process	0.62%	1.00	0.00	1.00	0.05	0.187	\$0.01	10
Other_Process_Controls_(batch+_site)	Process	0.23%	1.00	0.00	1.00	0.08	0.187	\$0.02	10
Power_recovery_Comp_Air	Process	0.61%	1.00	0.00	1.00	0.01	0.187	\$0.00	10
Power_recovery_Pumps	Process	2.48%	1.00	0.00	1.00	0.01	0.187	\$0.00	10
Process_control_Drives	Process	0.79%	1.00	0.00	1.00	0.02	0.187	\$0.00	10

## Statewide Industrial Electric Measure Inputs

\*Units for all measures are in kWh\*

Measure Name	End Use	Applicability	Base Density	Efficient Density	Total Density	kWh/ Unit Savings	Watts /kWh Ratio	Cost/ Unit	EUL
Process_control_Process	Process	0.00%	1.00	0.00	1.00	0.04	0.187	\$0.02	15
Process_Drives_ASD	Process	0.80%	1.00	0.00	1.00	0.01	0.187	\$0.00	10
Process_optimization	Process	0.10%	1.00	0.00	1.00	0.10	0.187	\$0.03	10
Pumps_ASD_(100+_hp)	Process	12.28%	1.00	0.00	1.00	0.06	0.187	\$0.01	6
Pumps_ASD_(1-5_hp)	Process	1.00%	1.00	0.00	1.00	0.06	0.187	\$0.08	14
Pumps_ASD_(6-100_hp)	Process	7.40%	1.00	0.00	1.00	0.06	0.187	\$0.00	10
Pumps_Controls	Process	7.26%	1.00	0.00	1.00	0.30	0.187	\$0.03	10
Pumps_Motor_practices-1_(100+_HP)	Process	12.28%	1.00	0.00	1.00	0.02	0.187	\$0.00	6
Pumps_Motor_practices-1_(1-5_HP)	Process	1.00%	1.00	0.00	1.00	0.05	0.187	\$0.02	14
Pumps_Motor_practices-1_(6-100_HP)	Process	7.40%	1.00	0.00	1.00	0.02	0.187	\$0.01	10
Pumps_OM	Process	8.28%	1.00	0.00	1.00	0.10	0.187	\$0.01	10
Pumps_Replace_100+_HP_motor	Process	2.94%	0.93	0.07	1.00	0.03	0.187	\$0.01	6
Pumps_Replace_1-5_HP_motor	Process	0.69%	1.00	0.00	1.00	0.06	0.187	\$0.05	14
Pumps_Replace_6-100_HP_motor	Process	20.73%	0.97	0.03	1.00	0.04	0.187	\$0.03	10
Pumps_Sizing	Process	4.17%	1.00	0.00	1.00	0.20	0.187	\$0.02	10
Pumps_System_Optimization	Process	6.21%	1.00	0.00	1.00	0.33	0.187	\$0.07	10
Refinery_Controls_Comp_Air	Process	1.23%	1.00	0.00	1.00	0.03	0.187	\$0.00	10
Refinery_Controls_Pumps	Process	4.96%	1.00	0.00	1.00	0.03	0.187	\$0.00	10
Replace_V-Belts_Drives	Process	0.67%	1.00	0.00	1.00	0.06	0.187	\$0.01	10
Efficient_Refrigeration_Operations	Refrigeration	1.39%	1.00	0.00	1.00	0.12	0.187	\$0.01	10
Energy_Star_Transformers_Refrigeration	Refrigeration	0.05%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Optimization_Refrigeration	Refrigeration	0.97%	1.00	0.00	1.00	0.26	0.187	\$0.11	15
Bakery_Process	Shell/HVAC	0.58%	1.00	0.00	1.00	0.37	0.187	\$0.05	15
Centrifugal_Chiller_0.51_kW_ton_500_tons	Shell/HVAC	2.23%	0.00	0.00	0.00	89.56	0.187	\$21.14	20
Chiller_Tune_Up_Diagnostics	Shell/HVAC	0.29%	0.00	0.00	0.00	59.36	0.187	\$16.67	10
Cool_Roof_Chiller	Shell/HVAC	0.62%	0.30	0.00	0.30	0.32	0.187	\$0.47	10
Cool_Roof_DX	Shell/HVAC	1.18%	0.18	0.00	0.18	0.55	0.187	\$0.47	10
Cooling_Circ_Pumps_VSD_	Shell/HVAC	1.23%	0.00	0.00	0.00	44.52	0.187	\$65.04	15
Drying_(UV_IR)	Shell/HVAC	0.00%	1.00	0.00	1.00	0.26	0.187	\$0.08	8
DX_Packaged_System_EER=10.9_10_tons	Shell/HVAC	2.50%	0.00	0.00	0.00	69.96	0.187	\$51.60	15
DX_Tune_Up_Advanced_Diagnostics	Shell/HVAC	1.43%	0.00	0.00	0.00	127.20	0.187	\$78.00	3
Efficient_Curing_ovens	Shell/HVAC	0.59%	1.00	0.00	1.00	0.20	0.187	\$0.08	15
Efficient_electric_melting	Shell/HVAC	0.06%	1.00	0.00	1.00	0.10	0.187	\$0.03	20

## Statewide Industrial Electric Measure Inputs

\*Units for all measures are in kWh\*

Measure Name	End Use	Applicability	Base Density	Efficient Density	Total Density	kWh/ Unit Savings	Watts /kWh Ratio	Cost/ Unit	EUL
EMS_Chiller_	Shell/HVAC	1.36%	0.00	0.00	0.00	74.20	0.187	\$60.00	10
Energy_Star_Transformers_Chiller	Shell/HVAC	0.00%	1.00	0.00	1.00	0.20	0.187	\$0.06	20
Energy_Star_Transformers_DX	Shell/HVAC	0.03%	1.00	0.00	1.00	0.20	0.187	\$0.06	20
Energy_Star_Transformers_Fan	Shell/HVAC	0.07%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Energy_Star_Transformers_Heating	Shell/HVAC	0.08%	1.00	0.00	1.00	0.20	0.187	\$0.07	20
Evaporative_Pre-Cooler	Shell/HVAC	0.93%	0.00	0.00	0.00	127.20	0.187	\$293.33	10
Fans_ASD_(100+_hp)	Shell/HVAC	4.83%	1.00	0.00	1.00	0.06	0.187	\$0.01	6
Fans_ASD_(1-5_hp)	Shell/HVAC	0.41%	1.00	0.00	1.00	0.06	0.187	\$0.08	14
Fans_ASD_(6-100_hp)	Shell/HVAC	2.92%	1.00	0.00	1.00	0.06	0.187	\$0.00	10
Fans_Controls	Shell/HVAC	2.03%	1.00	0.00	1.00	0.30	0.187	\$0.09	10
Fans_Motor_practices-1_(100+_HP)	Shell/HVAC	4.83%	1.00	0.00	1.00	0.02	0.187	\$0.00	6
Fans_Motor_practices-1_(1-5_HP)	Shell/HVAC	0.41%	1.00	0.00	1.00	0.05	0.187	\$0.02	14
Fans_Motor_practices-1_(6-100_HP)	Shell/HVAC	2.92%	1.00	0.00	1.00	0.02	0.187	\$0.01	10
Fans_OM	Shell/HVAC	4.08%	1.00	0.00	1.00	0.02	0.187	\$0.00	10
Fans_Replace_100+_HP_motor	Shell/HVAC	1.37%	0.97	0.03	1.00	0.03	0.187	\$0.01	6
Fans_Replace_1-5_HP_motor	Shell/HVAC	0.34%	1.00	0.00	1.00	0.06	0.187	\$0.05	14
Fans_Replace_6-100_HP_motor	Shell/HVAC	1.32%	0.99	0.01	1.00	0.04	0.187	\$0.03	10
Fans_System_Optimization	Shell/HVAC	1.20%	1.00	0.00	1.00	0.21	0.187	\$0.06	10
FansImprove_components	Shell/HVAC	1.61%	1.00	0.00	1.00	0.05	0.187	\$0.01	10
Heat_Pumps_Drying	Shell/HVAC	0.05%	1.00	0.00	1.00	0.22	0.187	\$0.18	15
Heating_Optimization_process_(MT)	Shell/HVAC	0.17%	1.00	0.00	1.00	0.10	0.187	\$0.01	10
Heating_Process_Control	Shell/HVAC	0.14%	1.00	0.00	1.00	0.05	0.187	\$0.02	15
Heating_Scheduling	Shell/HVAC	0.09%	1.00	0.00	1.00	0.06	0.187	\$0.01	10
Intelligent_extruder_(DOE)	Shell/HVAC	0.01%	1.00	0.00	1.00	0.02	0.187	\$0.02	10
Near_Net_Shape_Casting	Shell/HVAC	0.01%	1.00	0.00	1.00	0.12	0.187	\$0.01	15
Optimize_drying_process	Shell/HVAC	0.20%	1.00	0.00	1.00	0.20	0.187	\$0.05	10
Power_recovery_Fans	Shell/HVAC	0.37%	1.00	0.00	1.00	0.01	0.187	\$0.00	10
Prog_Thermostat_DX	Shell/HVAC	1.30%	0.00	0.00	0.00	127.20	0.187	\$20.50	10
Refinery_Controls_Fans	Shell/HVAC	0.75%	1.00	0.00	1.00	0.03	0.187	\$0.00	10
Top-heating_(glass)	Shell/HVAC	0.23%	1.00	0.00	1.00	0.04	0.187	\$0.00	8
Window_Film_Chiller	Shell/HVAC	0.84%	0.02	0.00	0.02	6.06	0.187	\$3.07	10
Window_Film_DX	Shell/HVAC	0.89%	0.01	0.00	0.01	10.39	0.187	\$3.07	10

## Statewide Industrial Gas Measure Inputs

**Table I-2: Statewide Industrial Gas Measure Inputs**

Statewide Industrial Gas Measure Inputs								
*Units for all measures are in Therms*								
Measure Name	End Use	Applicability	Base Density	Efficient Density	Total Density	Therms/ Unit Savings	Cost / Unit	EUL
Automatic_steam_trap_monitoring	Boiler	18.5%	1.00	0.00	1.00	0.00005	\$0.000041	15
Blowdown_steam_heat_recovery	Boiler	15.2%	1.00	0.00	1.00	0.000013	\$0.000041	15
Condensate_return	Boiler	0.7%	1.00	0.00	1.00	0.0001	\$0.000046	15
Flue_gas_heat_recovery_economizer	Boiler	18.5%	1.00	0.00	1.00	0.00002	\$0.000046	15
Maintain_boilers	Boiler	7.4%	1.00	0.00	1.00	0.0001	\$0.000002	2
Steam_trap_maintenance	Boiler	18.5%	1.00	0.00	1.00	0.000125	\$0.000024	2
Upgrade_burner_efficiency	Boiler	14.8%	1.00	0.00	1.00	0.000013	\$0.000014	20
Water_treatment	Boiler	36.9%	1.00	0.00	1.00	0.00001	\$0.000010	10
Boiler_95	Boiler	0.2%	1.00	0.00	1.00	0.00018	\$0.000433	20
Stack_heat_exchanger	Boiler	0.1%	1.00	0.00	1.00	0.00005	\$0.000210	20
Improved_process_control	Process	21.8%	1.00	0.00	1.00	0.00003	\$0.000017	15
Leak_repair	Process	4.5%	1.00	0.00	1.00	0.00004	\$0.000014	2
Load_control	Process	36.9%	1.00	0.00	1.00	0.00004	\$0.000019	15
Batch_cullet_preheating	Process	0.5%	1.00	0.00	1.00	0.00016	\$0.000458	15
Closed_hood	Process	0.2%	1.00	0.00	1.00	0.00005	\$0.000106	15
Combustion_controls	Process	0.9%	1.00	0.00	1.00	0.00008	\$0.000240	8
Efficient_burners	Process	3.9%	1.00	0.00	1.00	0.0001683	\$0.000385	10
Efficient_drying	Process	1.5%	1.00	0.00	1.00	0.0001336	\$0.000843	20
Extended_nip_press	Process	0.2%	1.00	0.00	1.00	0.00016	\$0.000159	20
Flare_gas_controls_and_recovery	Process	0.2%	1.00	0.00	1.00	0.0005	\$0.000159	20
Fouling_control	Process	2.4%	1.00	0.00	1.00	0.00007	\$0.000264	20
Heat_Recovery	Process	5.6%	1.00	0.00	1.00	0.0001645	\$0.000110	20
Improved_separation_processes	Process	0.5%	1.00	0.00	1.00	0.0001	\$0.000396	20
Insulation/reduce_heat_losses	Process	0.1%	1.00	0.00	1.00	0.00005	\$0.000160	15
Optimize_furnace_operations	Process	0.6%	1.00	0.00	1.00	0.0001	\$0.000722	10
Oxyfuel	Process	1.3%	1.00	0.00	1.00	0.0002	\$0.000008	20
Preventative_maintenance	Process	0.7%	1.00	0.00	1.00	0.00002	\$0.000106	5
Process_Controls_&_Management	Process	21.1%	1.00	0.00	1.00	6.003E-05	\$0.000067	8
Process_integration	Process	4.9%	1.00	0.00	1.00	0.0001856	\$0.000157	15

## Statewide Industrial Gas Measure Inputs

\*Units for all measures are in Therms\*

Measure Name	End Use	Applicability	Base Density	Efficient Density	Total Density	Therms/ Unit Savings	Cost / Unit	EUL
Thermal_oxidizers	Process	0.1%	1.00	0.00	1.00	0.0006	\$0.000054	15
Improved_insulation	Shell/HVAC	36.9%	1.00	0.00	1.00	0.00008	\$0.000057	15
Duct_insulation	Shell/HVAC	1.7%	1.00	0.00	1.00	0.00002	\$0.000041	20
EMS_install	Shell/HVAC	1.7%	1.00	0.00	1.00	0.0001	\$0.000372	20
EMS_optimization	Shell/HVAC	1.7%	1.00	0.00	1.00	0.00001	\$0.000008	5
Improve_ceiling_insulation	Shell/HVAC	1.7%	1.00	0.00	1.00	0.000243	\$0.000993	20
Furnace_HE	Shell/HVAC	2.0%	0.99	0.01	1.00	1.105E-05	\$0.001144	20



## Appendix J – Agricultural Measure Level Inputs

This appendix contains the measure inputs for the Agricultural sector. Agricultural inputs are separated by utility and by fuel type. The tables contains the measure name, end use, base density, efficient density, total density, kWh savings (electric), therms savings (gas), cost, and measure life.

### *PG&E Agricultural Measure Inputs*

#### **PG&E Electric Measure Inputs**

PG&E Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
HVAC-Dairies-Dairies-AG-E	HVAC	0.011	0.000	0.011	0.15	0.00011	\$0.10	15
HVAC-Animal Production / CAFOs-Chicken Egg-AG-E	HVAC	0.001	0.000	0.001	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Chicken Meat-AG-E	HVAC	0.001	0.000	0.001	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Poultry Hatcheries-AG-E	HVAC	0.001	0.000	0.001	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Misc. Animal-AG-E	HVAC	0.002	0.000	0.002	0.30	0.00011	\$0.21	15
HVAC-Greenhouses and Nurseries-Floriculture-AG-E	HVAC	0.001	0.000	0.001	0.18	0.00011	\$0.12	15
HVAC-Greenhouses and Nurseries-Mushroom Production-AG-E	HVAC	0.004	0.000	0.004	0.18	0.00011	\$2.83	15
HVAC-Greenhouses and Nurseries-Nurseries & Trees-AG-E	HVAC	0.000	0.000	0.000	0.18	0.00011	\$2.83	15
HVAC-Vineyards and Wineries-Wineries-AG-E	HVAC	0.006	0.000	0.006	0.15	0.00011	\$0.11	15
HVAC-Post Harvest Processing-Cotton Ginning-AG-E	HVAC	0.002	0.000	0.002	0.15	0.00011	\$0.10	15
Lighting-Dairies-Dairies-AG-E	Lighting	0.014	0.000	0.014	0.51	0.00011	\$0.09	15
Lighting-Animal Production / CAFOs-Cattle Feedlots-AG-E	Lighting	0.000	0.000	0.000	0.43	0.00011	\$0.43	15
Lighting-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Lighting	0.000	0.000	0.000	0.43	0.00011	\$0.43	15
Lighting-Animal Production / CAFOs-Chicken Egg-AG-E	Lighting	0.003	0.000	0.003	0.83	0.00011	\$0.15	15
Lighting-Animal Production / CAFOs-Chicken Meat-AG-E	Lighting	0.002	0.000	0.002	0.43	0.00011	\$0.08	15
Lighting-Animal Production / CAFOs-Poultry Hatcheries-AG-E	Lighting	0.002	0.000	0.002	0.63	0.00011	\$0.12	15
Lighting-Animal Production / CAFOs-Misc. Animal-AG-E	Lighting	0.003	0.000	0.003	0.43	0.00011	\$0.08	15
Lighting-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Lighting	0.005	0.000	0.005	0.26	0.00011	\$0.05	15



PG&E Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Lighting-Greenhouses and Nurseries-Floriculture-AG-E	Lighting	0.002	0.000	0.002	0.59	0.00011	\$0.11	15
Lighting-Greenhouses and Nurseries-Mushroom Production-AG-E	Lighting	0.004	0.000	0.004	0.43	0.00011	\$0.08	15
Lighting-Vineyards and Wineries-Wineries-AG-E	Lighting	0.023	0.000	0.023	0.47	0.00011	\$0.09	15
Lighting-Post Harvest Processing-Post Harvest-AG-E	Lighting	0.016	0.000	0.016	0.31	0.00011	\$0.06	15
Lighting-Post Harvest Processing-Cotton Ginning-AG-E	Lighting	0.002	0.000	0.002	0.31	0.00011	\$0.06	15
Misc-Irrigated Agriculture-Oilseed & Grain Crops-AG-E	Misc	0.001	0.000	0.001	0.26	0.00011	\$0.16	15
Misc-Irrigated Agriculture-Vegetable & Melon Crops-AG-E	Misc	0.002	0.000	0.002	0.26	0.00011	\$0.16	15
Misc-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-E	Misc	0.009	0.000	0.009	0.26	0.00011	\$0.16	15
Misc-Irrigated Agriculture-Misc. Crops-AG-E	Misc	0.007	0.000	0.007	0.26	0.00011	\$0.16	15
Misc.-Animal Production / CAFOs-Cattle Feedlots-AG-E	Misc.	0.000	0.000	0.000	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Misc.	0.001	0.000	0.001	0.35	0.00011	\$0.21	15
Misc.-Animal Production / CAFOs-Chicken Egg-AG-E	Misc.	0.001	0.000	0.001	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Chicken Meat-AG-E	Misc.	0.001	0.000	0.001	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Poultry Hatcheries-AG-E	Misc.	0.000	0.000	0.000	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Misc. Animal-AG-E	Misc.	0.002	0.000	0.002	0.27	0.00011	\$0.16	15
Misc.-Greenhouses and Nurseries-Floriculture-AG-E	Misc.	0.000	0.000	0.000	0.15	0.00011	\$2.36	15
Misc.-Greenhouses and Nurseries-Mushroom Production-AG-E	Misc.	0.001	0.000	0.001	0.15	0.00011	\$2.36	15
Misc.-Greenhouses and Nurseries-Nurseries & Trees-AG-E	Misc.	0.001	0.000	0.001	0.15	0.00011	\$2.36	15
Misc.-Greenhouses and Nurseries-Misc. Greenhouses & Nurseries-AG-E	Misc.	0.002	0.000	0.002	0.15	0.00011	\$2.36	15
Misc.-Post Harvest Processing-Post Harvest-AG-E	Misc.	0.031	0.000	0.031	0.16	0.00011	\$0.10	15
Misc.-Post Harvest Processing-Cotton Ginning-AG-E	Misc.	0.001	0.000	0.001	0.15	0.00011	\$0.09	15
N/A-Misc.-Other Unassigned-AG-E	Misc.	0.014	0.000	0.014	0.15	0.00011	\$0.09	15
Misc. -Dairies-Dairies-AG-E	Misc.	0.028	0.000	0.028	0.20	0.00011	\$0.12	15
Misc. -Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Misc.	0.005	0.000	0.005	0.15	0.00011	\$0.09	15
Misc. -Vineyards and Wineries-	Misc.	0.006	0.000	0.006	0.17	0.00011	\$0.11	15

PG&E Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Wineries-AG-E								
Misc. -Vineyards and Wineries-Vineyards-AG-E	Misc.	0.002	0.000	0.002	0.24	0.00011	\$0.14	15
Motor-Post Harvest Processing-Post Harvest-AG-E	Motor	0.016	0.000	0.016	0.33	0.00011	\$0.14	15
Motor-Post Harvest Processing-Cotton Ginning-AG-E	Motor	0.006	0.000	0.006	0.31	0.00011	\$0.13	15
Motors-Dairies-Dairies-AG-E	Motors	0.017	0.000	0.017	0.30	0.00011	\$0.12	15
Motors-Animal Production / CAFOs-Cattle Feedlots-AG-E	Motors	0.001	0.000	0.001	0.36	0.00011	\$0.15	15
Motors-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Motors	0.008	0.000	0.008	0.36	0.00011	\$0.15	15
Motors-Animal Production / CAFOs-Misc. Animal-AG-E	Motors	0.002	0.000	0.002	0.36	0.00011	\$0.15	15
Motors-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Motors	0.011	0.000	0.011	0.44	0.00011	\$0.18	15
Motors-Irrigated Agriculture-Oilseed & Grain Crops-AG-E	Motors	0.020	0.000	0.020	0.34	0.00011	\$0.14	15
Motors-Irrigated Agriculture-Vegetable & Melon Crops-AG-E	Motors	0.034	0.000	0.034	0.35	0.00011	\$0.14	15
Motors-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-E	Motors	0.167	0.000	0.167	0.38	0.00011	\$0.16	15
Motors-Irrigated Agriculture-Misc. Crops-AG-E	Motors	0.140	0.000	0.140	0.38	0.00011	\$0.16	15
Motors-Greenhouses and Nurseries-Floriculture-AG-E	Motors	0.002	0.000	0.002	0.29	0.00011	\$0.12	15
Motors-Greenhouses and Nurseries-Mushroom Production-AG-E	Motors	0.002	0.000	0.002	0.29	0.00011	\$0.12	15
Motors-Greenhouses and Nurseries-Nurseries & Trees-AG-E	Motors	0.007	0.000	0.007	0.29	0.00011	\$0.12	15
Motors-Vineyards and Wineries-Wineries-AG-E	Motors	0.017	0.000	0.017	0.20	0.00011	\$0.08	15
Motors-Vineyards and Wineries-Vineyards-AG-E	Motors	0.042	0.000	0.042	0.33	0.00011	\$0.14	15
Process-Animal Production / CAFOs-Misc. Animal-AG-E	Process	0.003	0.000	0.003	0.15	0.00011	\$0.06	15
Process-Vineyards and Wineries-Wineries-AG-E	Process	0.017	0.000	0.017	0.35	0.00011	\$0.15	15
Refrigeration-Dairies-Dairies-AG-E	Refrigeration	0.029	0.000	0.029	0.07	0.00011	\$0.02	15
Refrigeration-Animal Production / CAFOs-Chicken Egg-AG-E	Refrigeration	0.000	0.000	0.000	0.30	0.00011	\$0.07	15
Refrigeration-Animal Production / CAFOs-Chicken Meat-AG-E	Refrigeration	0.001	0.000	0.001	0.15	0.00011	\$0.04	15
Refrigeration-Animal Production / CAFOs-Misc. Animal-AG-E	Refrigeration	0.002	0.000	0.002	0.15	0.00011	\$0.04	15
Refrigeration-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Refrigeration	0.086	0.000	0.086	0.12	0.00011	\$0.03	15

PG&E Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Refrigeration-Greenhouses and Nurseries-Floriculture-AG-E	Refrigeration	0.001	0.000	0.001	0.42	0.00011	\$6.62	15
Refrigeration-Vineyards and Wineries-Wineries-AG-E	Refrigeration	0.028	0.000	0.028	0.09	0.00011	\$0.02	15
Refrigeration-Post Harvest Processing-Post Harvest-AG-E	Refrigeration	0.094	0.000	0.094	0.48	0.00011	\$0.12	15
Water Heating & Cooling-Vineyards and Wineries-Wineries-AG-E	Water Heating & Cooling	0.017	0.000	0.017	0.15	0.00011	\$0.08	15
Water Heating and Cooling-Dairies-Dairies-AG-E	Water Heating and Cooling	0.009	0.000	0.009	0.26	0.00011	\$0.14	15
Water Heating and Cooling-Animal Production / CAFOs-Misc. Animal-AG-E	Water Heating and Cooling	0.002	0.000	0.002	0.04	0.00011	\$0.02	15
Ag-Elec - WB-NC	WB-NC	0.005	0.000	0.005	0.20	0.00011	\$0.06	30

## PG&E Gas Measure Inputs

PG&E Agricultural Gas Measure Inputs							
*Units for all measures are in % of Consumption*							
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction/1000	Cost / Unit	EUL
HVAC-Animal Production / CAFOs-Chicken Egg-AG-G	HVAC	0.00	0.00	0.00	0.0000218	\$0.000121	15
HVAC-Animal Production / CAFOs-Chicken Meat-AG-G	HVAC	0.01	0.00	0.01	0.0000484	\$0.000268	15
HVAC-Animal Production / CAFOs-Poultry Hatcheries-AG-G	HVAC	0.00	0.00	0.00	0.0000091	\$0.000051	15
HVAC-Animal Production / CAFOs-Misc. Animal-AG-G	HVAC	0.00	0.00	0.00	0.0000130	\$0.000072	15
HVAC-Refrigerated Warehouses-Refrigerated Warehouses-AG-G	HVAC	0.02	0.00	0.02	0.0000847	\$0.000470	15
HVAC-Greenhouses and Nurseries-Floriculture-AG-G	HVAC	0.12	0.00	0.12	0.0007349	\$0.001594	15
HVAC-Greenhouses and Nurseries-Mushroom Production-AG-G	HVAC	0.04	0.00	0.04	0.0002309	\$0.000501	15
HVAC-Greenhouses and Nurseries-Nurseries & Trees-AG-G	HVAC	0.00	0.00	0.00	0.0000168	\$0.000036	15
HVAC-Vineyards and Wineries-Wineries-AG-G	HVAC	0.05	0.00	0.05	0.0002344	\$0.001300	15
HVAC-Vineyards and Wineries-Vineyards-AG-G	HVAC	0.00	0.00	0.00	0.0000073	\$0.000040	15
Misc-Irrigated Agriculture-Oilseed & Grain Crops-AG-G	Misc	0.00	0.00	0.00	0.0000016	\$0.000004	15
Misc-Irrigated Agriculture-Vegetable & Melon Crops-AG-G	Misc	0.00	0.00	0.00	0.0000175	\$0.000038	15
Misc-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-G	Misc	0.00	0.00	0.00	0.0000559	\$0.000121	15
Misc-Irrigated Agriculture-Misc. Crops-AG-G	Misc	0.01	0.00	0.01	0.0001599	\$0.000347	15
Misc.-Animal Production / CAFOs-Cattle Feedlots-AG-G	Misc.	0.00	0.00	0.00	0.0000022	\$0.000005	15
Misc.-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Misc.	0.00	0.00	0.00	0.0000038	\$0.000008	15
Misc.-Animal Production / CAFOs-Misc. Animal-AG-G	Misc.	0.00	0.00	0.00	0.0000193	\$0.000042	15
Misc.-Greenhouses and Nurseries-Floriculture-AG-G	Misc.	0.01	0.00	0.01	0.0000323	\$0.000070	15
Misc.-Greenhouses and Nurseries-Mushroom Production-AG-G	Misc.	0.00	0.00	0.00	0.0000099	\$0.000022	15
Misc.-Greenhouses and Nurseries-Nurseries & Trees-AG-G	Misc.	0.00	0.00	0.00	0.0000084	\$0.000018	15
Misc.-Greenhouses and Nurseries-Misc. Greenhouses & Nurseries-AG-G	Misc.	0.02	0.00	0.02	0.0001597	\$0.000346	15
Misc.-Post Harvest Processing-Post Harvest-AG-G	Misc.	0.02	0.00	0.02	0.0001048	\$0.000227	15
Misc.-Post Harvest Processing-Cotton	Misc.	0.00	0.00	0.00	0.0000034	\$0.000007	15

## PG&E Agricultural Gas Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction/1000	Cost / Unit	EUL
Ginning-AG-G							
Misc. -Dairies-Dairies-AG-G	Misc.	0.00	0.00	0.00	0.0000012	\$0.000003	15
Misc. -Refrigerated Warehouses-Refrigerated Warehouses-AG-G	Misc.	0.00	0.00	0.00	0.0000050	\$0.000011	15
Misc. -Vineyards and Wineries-Wineries-AG-G	Misc.	0.02	0.00	0.02	0.0001562	\$0.000339	15
Misc. -Vineyards and Wineries-Vineyards-AG-G	Misc.	0.00	0.00	0.00	0.0000049	\$0.000011	15
Process-Animal Production / CAFOs-Cattle Feedlots-AG-G	Process	0.01	0.00	0.01	0.0000325	\$0.000022	15
Process-Animal Production / CAFOs-Cattle Ranching & Farming-AG-G	Process	0.00	0.00	0.00	0.0000001	\$0.000000	15
Process-Animal Production / CAFOs-Chicken Meat-AG-G	Process	0.00	0.00	0.00	0.0000102	\$0.000007	15
Process-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Process	0.00	0.00	0.00	0.0000038	\$0.000003	15
Process-Animal Production / CAFOs-Misc. Animal-AG-G	Process	0.00	0.00	0.00	0.0000144	\$0.000010	15
Process-Irrigated Agriculture-Oilseed & Grain Crops-AG-G	Process	0.00	0.00	0.00	0.0000137	\$0.000009	15
Process-Irrigated Agriculture-Vegetable & Melon Crops-AG-G	Process	0.01	0.00	0.01	0.0000367	\$0.000025	15
Process-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-G	Process	0.02	0.00	0.02	0.0001173	\$0.000081	15
Process-Irrigated Agriculture-Misc. Crops-AG-G	Process	0.01	0.00	0.01	0.0000592	\$0.000041	15
Process-Greenhouses and Nurseries-Nurseries & Trees-AG-G	Process	0.01	0.00	0.01	0.0000184	\$0.000013	15
Process-Vineyards and Wineries-Wineries-AG-G	Process	0.15	0.00	0.15	0.0035934	\$0.002469	15
Process-Vineyards and Wineries-Vineyards-AG-G	Process	0.01	0.00	0.01	0.0000316	\$0.000022	15
Process-Post Harvest Processing-Post Harvest-AG-G	Process	0.32	0.00	0.32	0.0012166	\$0.002639	15
Process-Post Harvest Processing-Cotton Ginning-AG-G	Process	0.01	0.00	0.01	0.0000879	\$0.000060	15
Water Heating & Cooling-Refrigerated Warehouses-Refrigerated Warehouses-AG-G	Water Heating & Cooling	0.00	0.00	0.00	0.0000045	\$0.000001	15
Water Heating & Cooling-Vineyards and Wineries-Wineries-AG-G	Water Heating & Cooling	0.09	0.00	0.09	0.0002968	\$0.000082	15
Water Heating & Cooling-Vineyards and Wineries-Vineyards-AG-G	Water Heating & Cooling	0.00	0.00	0.00	0.0000292	\$0.000008	15
Water Heating and Cooling-Dairies-Dairies-AG-G	Water Heating and Cooling	0.01	0.00	0.01	0.0000491	\$0.000014	15

## PG&E Agricultural Gas Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction/1000	Cost / Unit	EUL
Water Heating and Cooling-Animal Production / CAFOs-Cattle Feedlots-AG-G	Water Heating and Cooling	0.00	0.00	0.00	0.0000032	\$0.000001	15
Water Heating and Cooling-Animal Production / CAFOs-Chicken Egg-AG-G	Water Heating and Cooling	0.00	0.00	0.00	0.0000048	\$0.000001	15
Water Heating and Cooling-Animal Production / CAFOs-Chicken Meat-AG-G	Water Heating and Cooling	0.02	0.00	0.02	0.0000308	\$0.000008	15
Water Heating and Cooling-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Water Heating and Cooling	0.00	0.00	0.00	0.0000028	\$0.000001	15
Water Heating and Cooling-Animal Production / CAFOs-Misc. Animal-AG-G	Water Heating and Cooling	0.00	0.00	0.00	0.0000052	\$0.000001	15
Ag-Gas - WB-NC	WB-NC	0.01	0.00	0.01	0.2000000	\$54.886936	30

## SCE Agricultural Measure Inputs

### SCE Electric Measure Inputs

SCE Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings fraction	Watts /kWh Ratio	Cost/ Unit	EUL
HVAC-Dairies-Dairies-AG-E	HVAC	0.023	0.000	0.023	0.15	0.00011	\$0.10	15
HVAC-Animal Production / CAFOs-Chicken Egg-AG-E	HVAC	0.001	0.000	0.001	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Chicken Meat-AG-E	HVAC	0.001	0.000	0.001	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Poultry Hatcheries-AG-E	HVAC	0.001	0.000	0.001	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Misc. Animal-AG-E	HVAC	0.002	0.000	0.002	0.30	0.00011	\$0.21	15
HVAC-Greenhouses and Nurseries-Floriculture-AG-E	HVAC	0.003	0.000	0.003	0.18	0.00011	\$0.12	15
HVAC-Greenhouses and Nurseries-Mushroom Production-AG-E	HVAC	0.009	0.000	0.009	0.18	0.00011	\$2.83	15
HVAC-Greenhouses and Nurseries-Nurseries & Trees-AG-E	HVAC	0.001	0.000	0.001	0.18	0.00011	\$2.83	15
HVAC-Vineyards and Wineries-Wineries-AG-E	HVAC	0.001	0.000	0.001	0.15	0.00011	\$0.11	15
HVAC-Post Harvest Processing-Cotton Ginning-AG-E	HVAC	0.001	0.000	0.001	0.15	0.00011	\$0.10	15
Lighting-Dairies-Dairies-AG-E	Lighting	0.031	0.000	0.031	0.51	0.00011	\$0.09	15
Lighting-Animal Production / CAFOs-Cattle Feedlots-AG-E	Lighting	0.000	0.000	0.000	0.43	0.00011	\$0.43	15
Lighting-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Lighting	0.001	0.000	0.001	0.43	0.00011	\$0.43	15
Lighting-Animal Production / CAFOs-Chicken Egg-AG-E	Lighting	0.003	0.000	0.003	0.83	0.00011	\$0.15	15
Lighting-Animal Production / CAFOs-Chicken Meat-AG-E	Lighting	0.002	0.000	0.002	0.43	0.00011	\$0.08	15
Lighting-Animal Production / CAFOs-Poultry Hatcheries-AG-E	Lighting	0.002	0.000	0.002	0.63	0.00011	\$0.12	15
Lighting-Animal Production / CAFOs-Misc. Animal-AG-E	Lighting	0.003	0.000	0.003	0.43	0.00011	\$0.08	15
Lighting-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Lighting	0.006	0.000	0.006	0.26	0.00011	\$0.05	15
Lighting-Greenhouses and Nurseries-Floriculture-AG-E	Lighting	0.005	0.000	0.005	0.59	0.00011	\$0.11	15
Lighting-Greenhouses and Nurseries-Mushroom Production-AG-E	Lighting	0.009	0.000	0.009	0.43	0.00011	\$0.08	15
Lighting-Vineyards and Wineries-Wineries-AG-E	Lighting	0.002	0.000	0.002	0.47	0.00011	\$0.09	15
Lighting-Post Harvest Processing-Post Harvest-AG-E	Lighting	0.009	0.000	0.009	0.31	0.00011	\$0.06	15

SCE Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Lighting-Post Harvest Processing-Cotton Ginning-AG-E	Lighting	0.001	0.000	0.001	0.31	0.00011	\$0.06	15
Misc-Irrigated Agriculture-Oilseed & Grain Crops-AG-E	Misc	0.001	0.000	0.001	0.26	0.00011	\$0.16	15
Misc-Irrigated Agriculture-Vegetable & Melon Crops-AG-E	Misc	0.002	0.000	0.002	0.26	0.00011	\$0.16	15
Misc-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-E	Misc	0.010	0.000	0.010	0.26	0.00011	\$0.16	15
Misc-Irrigated Agriculture-Misc. Crops-AG-E	Misc	0.008	0.000	0.008	0.26	0.00011	\$0.16	15
Misc.-Animal Production / CAFOs-Cattle Feedlots-AG-E	Misc.	0.000	0.000	0.000	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Misc.	0.002	0.000	0.002	0.35	0.00011	\$0.21	15
Misc.-Animal Production / CAFOs-Chicken Egg-AG-E	Misc.	0.001	0.000	0.001	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Chicken Meat-AG-E	Misc.	0.001	0.000	0.001	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Poultry Hatcheries-AG-E	Misc.	0.000	0.000	0.000	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Misc. Animal-AG-E	Misc.	0.002	0.000	0.002	0.27	0.00011	\$0.16	15
Misc.-Greenhouses and Nurseries-Floriculture-AG-E	Misc.	0.001	0.000	0.001	0.15	0.00011	\$2.36	15
Misc.-Greenhouses and Nurseries-Mushroom Production-AG-E	Misc.	0.003	0.000	0.003	0.15	0.00011	\$2.36	15
Misc.-Greenhouses and Nurseries-Nurseries & Trees-AG-E	Misc.	0.002	0.000	0.002	0.15	0.00011	\$2.36	15
Misc.-Greenhouses and Nurseries-Misc. Greenhouses & Nurseries-AG-E	Misc.	0.005	0.000	0.005	0.15	0.00011	\$2.36	15
Misc.-Post Harvest Processing-Post Harvest-AG-E	Misc.	0.018	0.000	0.018	0.16	0.00011	\$0.10	15
Misc.-Post Harvest Processing-Cotton Ginning-AG-E	Misc.	0.001	0.000	0.001	0.15	0.00011	\$0.09	15
N/A-Misc.-Other Unassigned-AG-E	Misc.	0.014	0.000	0.014	0.15	0.00011	\$0.09	15
Misc. -Dairies-Dairies-AG-E	Misc.	0.061	0.000	0.061	0.20	0.00011	\$0.12	15
Misc. -Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Misc.	0.006	0.000	0.006	0.15	0.00011	\$0.09	15
Misc. -Vineyards and Wineries-Wineries-AG-E	Misc.	0.001	0.000	0.001	0.17	0.00011	\$0.11	15
Misc. -Vineyards and Wineries-Vineyards-AG-E	Misc.	0.000	0.000	0.000	0.24	0.00011	\$0.14	15
Motor-Post Harvest Processing-Post Harvest-AG-E	Motor	0.009	0.000	0.009	0.33	0.00011	\$0.14	15
Motor-Post Harvest Processing-Cotton Ginning-AG-E	Motor	0.004	0.000	0.004	0.31	0.00011	\$0.13	15
Motors-Dairies-Dairies-AG-E	Motors	0.038	0.000	0.038	0.30	0.00011	\$0.12	15



SCE Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Motors-Animal Production / CAFOs-Cattle Feedlots-AG-E	Motors	0.001	0.000	0.001	0.36	0.00011	\$0.15	15
Motors-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Motors	0.008	0.000	0.008	0.36	0.00011	\$0.15	15
Motors-Animal Production / CAFOs-Misc. Animal-AG-E	Motors	0.002	0.000	0.002	0.36	0.00011	\$0.15	15
Motors-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Motors	0.011	0.000	0.011	0.44	0.00011	\$0.18	15
Motors-Irrigated Agriculture-Oilseed & Grain Crops-AG-E	Motors	0.023	0.000	0.023	0.34	0.00011	\$0.14	15
Motors-Irrigated Agriculture-Vegetable & Melon Crops-AG-E	Motors	0.040	0.000	0.040	0.35	0.00011	\$0.14	15
Motors-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-E	Motors	0.192	0.000	0.192	0.38	0.00011	\$0.16	15
Motors-Irrigated Agriculture-Misc. Crops-AG-E	Motors	0.160	0.000	0.160	0.38	0.00011	\$0.16	15
Motors-Greenhouses and Nurseries-Floriculture-AG-E	Motors	0.003	0.000	0.003	0.29	0.00011	\$0.12	15
Motors-Greenhouses and Nurseries-Mushroom Production-AG-E	Motors	0.005	0.000	0.005	0.29	0.00011	\$0.12	15
Motors-Greenhouses and Nurseries-Nurseries & Trees-AG-E	Motors	0.016	0.000	0.016	0.29	0.00011	\$0.12	15
Motors-Vineyards and Wineries-Wineries-AG-E	Motors	0.002	0.000	0.002	0.20	0.00011	\$0.08	15
Motors-Vineyards and Wineries-Vineyards-AG-E	Motors	0.004	0.000	0.004	0.33	0.00011	\$0.14	15
Process-Animal Production / CAFOs-Misc. Animal-AG-E	Process	0.003	0.000	0.003	0.15	0.00011	\$0.06	15
Process-Vineyards and Wineries-Wineries-AG-E	Process	0.002	0.000	0.002	0.35	0.00011	\$0.15	15
Refrigeration-Dairies-Dairies-AG-E	Refrigeration	0.063	0.000	0.063	0.07	0.00011	\$0.02	15
Refrigeration-Animal Production / CAFOs-Chicken Egg-AG-E	Refrigeration	0.000	0.000	0.000	0.30	0.00011	\$0.07	15
Refrigeration-Animal Production / CAFOs-Chicken Meat-AG-E	Refrigeration	0.001	0.000	0.001	0.15	0.00011	\$0.04	15
Refrigeration-Animal Production / CAFOs-Misc. Animal-AG-E	Refrigeration	0.002	0.000	0.002	0.15	0.00011	\$0.04	15
Refrigeration-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Refrigeration	0.088	0.000	0.088	0.12	0.00011	\$0.03	15
Refrigeration-Greenhouses and Nurseries-Floriculture-AG-E	Refrigeration	0.001	0.000	0.001	0.42	0.00011	\$6.62	15
Refrigeration-Vineyards and Wineries-Wineries-AG-E	Refrigeration	0.003	0.000	0.003	0.09	0.00011	\$0.02	15
Refrigeration-Post Harvest Processing-Post Harvest-AG-E	Refrigeration	0.055	0.000	0.055	0.48	0.00011	\$0.12	15
Water Heating & Cooling-Vineyards and Wineries-Wineries-AG-E	Water Heating & Cooling	0.002	0.000	0.002	0.15	0.00011	\$0.08	15

### SCE Agricultural Electric Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Water Heating and Cooling-Dairies-Dairies-AG-E	Water Heating and Cooling	0.019	0.000	0.019	0.26	0.00011	\$0.09	15
Water Heating and Cooling-Animal Production / CAFOs-Misc. Animal-AG-E	Water Heating and Cooling	0.002	0.000	0.002	0.04	0.00011	\$0.02	15
Ag-Elec - WB-NC	WB-NC	0.005	0.000	0.005	0.20	0.00011	\$0.06	30

## SCG Agricultural Measure Inputs

### SCG Gas Measure Inputs

SCG Agricultural Gas Measure Inputs							
*Units for all measures are in % of Consumption*							
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction/ 1000	Cost / Unit	EUL
HVAC-Animal Production / CAFOs-Chicken Egg-AG-G	HVAC	0.006	0.000	0.006	0.0000368	\$0.000199	15
HVAC-Animal Production / CAFOs-Chicken Meat-AG-G	HVAC	0.018	0.000	0.018	0.0000816	\$0.000442	15
HVAC-Animal Production / CAFOs-Poultry Hatcheries-AG-G	HVAC	0.003	0.000	0.003	0.0000154	\$0.000084	15
HVAC-Animal Production / CAFOs-Misc. Animal-AG-G	HVAC	0.005	0.000	0.005	0.0000219	\$0.000118	15
HVAC-Refrigerated Warehouses-Refrigerated Warehouses-AG-G	HVAC	0.015	0.000	0.015	0.0000767	\$0.000415	15
HVAC-Greenhouses and Nurseries-Floriculture-AG-G	HVAC	0.205	0.000	0.205	0.0012571	\$0.002685	15
HVAC-Greenhouses and Nurseries-Mushroom Production-AG-G	HVAC	0.063	0.000	0.063	0.0003950	\$0.000844	15
HVAC-Greenhouses and Nurseries-Nurseries & Trees-AG-G	HVAC	0.005	0.000	0.005	0.0000287	\$0.000061	15
HVAC-Vineyards and Wineries-Wineries-AG-G	HVAC	0.010	0.000	0.010	0.0000486	\$0.000263	15
HVAC-Vineyards and Wineries-Vineyards-AG-G	HVAC	0.000	0.000	0.000	0.0000015	\$0.000008	15
Misc-Irrigated Agriculture-Oilseed & Grain Crops-AG-G	Misc	0.000	0.000	0.000	0.0000079	\$0.000017	15
Misc-Irrigated Agriculture-Vegetable & Melon Crops-AG-G	Misc	0.005	0.000	0.005	0.0000847	\$0.000181	15
Misc-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-G	Misc	0.016	0.000	0.016	0.0002706	\$0.000578	15
Misc-Irrigated Agriculture-Misc. Crops-AG-G	Misc	0.045	0.000	0.045	0.0007733	\$0.001652	15
Misc.-Animal Production / CAFOs-Cattle Feedlots-AG-G	Misc.	0.001	0.000	0.001	0.0000037	\$0.000008	15
Misc.-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Misc.	0.001	0.000	0.001	0.0000064	\$0.000014	15
Misc.-Animal Production / CAFOs-Misc. Animal-AG-G	Misc.	0.005	0.000	0.005	0.0000326	\$0.000070	15
Misc.-Greenhouses and Nurseries-Floriculture-AG-G	Misc.	0.011	0.000	0.011	0.0000552	\$0.000118	15
Misc.-Greenhouses and Nurseries-Mushroom Production-AG-G	Misc.	0.003	0.000	0.003	0.0000170	\$0.000036	15
Misc.-Greenhouses and Nurseries-Nurseries & Trees-AG-G	Misc.	0.003	0.000	0.003	0.0000144	\$0.000031	15
Misc.-Greenhouses and Nurseries-Misc. Greenhouses & Nurseries-AG-G	Misc.	0.031	0.000	0.031	0.0002732	\$0.000584	15

## SCG Agricultural Gas Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction/ 1000	Cost / Unit	EUL
Misc.-Post Harvest Processing-Post Harvest-AG-G	Misc.	0.010	0.000	0.010	0.0000644	\$0.000138	15
Misc.-Post Harvest Processing-Cotton Ginning-AG-G	Misc.	0.000	0.000	0.000	0.0000021	\$0.000004	15
Misc. -Dairies-Dairies-AG-G	Misc.	0.001	0.000	0.001	0.0000047	\$0.000010	15
Misc. -Refrigerated Warehouses-Refrigerated Warehouses-AG-G	Misc.	0.001	0.000	0.001	0.0000045	\$0.000010	15
Misc. -Vineyards and Wineries-Wineries-AG-G	Misc.	0.003	0.000	0.003	0.0000324	\$0.000069	15
Misc. -Vineyards and Wineries-Vineyards-AG-G	Misc.	0.000	0.000	0.000	0.0000010	\$0.000002	15
Process-Animal Production / CAFOs-Cattle Feedlots-AG-G	Process	0.011	0.000	0.011	0.0000548	\$0.000038	15
Process-Animal Production / CAFOs-Cattle Ranching & Farming-AG-G	Process	0.000	0.000	0.000	0.0000002	\$0.000000	15
Process-Animal Production / CAFOs-Chicken Meat-AG-G	Process	0.005	0.000	0.005	0.0000173	\$0.000012	15
Process-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Process	0.001	0.000	0.001	0.0000064	\$0.000004	15
Process-Animal Production / CAFOs-Misc. Animal-AG-G	Process	0.005	0.000	0.005	0.0000243	\$0.000017	15
Process-Irrigated Agriculture-Oilseed & Grain Crops-AG-G	Process	0.009	0.000	0.009	0.0000660	\$0.000045	15
Process-Irrigated Agriculture-Vegetable & Melon Crops-AG-G	Process	0.028	0.000	0.028	0.0001775	\$0.000122	15
Process-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-G	Process	0.090	0.000	0.090	0.0005673	\$0.000390	15
Process-Irrigated Agriculture-Misc. Crops-AG-G	Process	0.045	0.000	0.045	0.0002861	\$0.000197	15
Process-Greenhouses and Nurseries-Nurseries & Trees-AG-G	Process	0.011	0.000	0.011	0.0000314	\$0.000022	15
Process-Vineyards and Wineries-Wineries-AG-G	Process	0.032	0.000	0.032	0.0007458	\$0.000512	15
Process-Vineyards and Wineries-Vineyards-AG-G	Process	0.001	0.000	0.001	0.0000066	\$0.000005	15
Process-Post Harvest Processing-Post Harvest-AG-G	Process	0.199	0.000	0.199	0.0007483	\$0.000514	15
Process-Post Harvest Processing-Cotton Ginning-AG-G	Process	0.008	0.000	0.008	0.0000541	\$0.000037	15
Water Heating & Cooling-Refrigerated Warehouses-Refrigerated Warehouses-AG-G	Water Heating & Cooling	0.001	0.000	0.001	0.0000040	\$0.000001	15
Water Heating & Cooling-Vineyards and Wineries-Wineries-AG-G	Water Heating & Cooling	0.019	0.000	0.019	0.0000616	\$0.000019	15
Water Heating & Cooling-Vineyards and Wineries-Vineyards-AG-G	Water Heating & Cooling	0.000	0.000	0.000	0.0000061	\$0.000002	15

## SCG Agricultural Gas Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction/ 1000	Cost / Unit	EUL
Water Heating and Cooling-Dairies-Dairies-AG-G	Water Heating and Cooling	0.025	0.000	0.025	0.0001966	\$0.000060	15
Water Heating and Cooling-Animal Production / CAFOs-Cattle Feedlots-AG-G	Water Heating and Cooling	0.003	0.000	0.003	0.0000053	\$0.000002	15
Water Heating and Cooling-Animal Production / CAFOs-Chicken Egg-AG-G	Water Heating and Cooling	0.004	0.000	0.004	0.0000080	\$0.000002	15
Water Heating and Cooling-Animal Production / CAFOs-Chicken Meat-AG-G	Water Heating and Cooling	0.028	0.000	0.028	0.0000519	\$0.000016	15
Water Heating and Cooling-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Water Heating and Cooling	0.003	0.000	0.003	0.0000047	\$0.000001	15
Water Heating and Cooling-Animal Production / CAFOs-Misc. Animal-AG-G	Water Heating and Cooling	0.005	0.000	0.005	0.0000089	\$0.000003	15
Ag-Gas - WB-NC	WB-NC	0.005	0.000	0.005	0.2000000	\$54.944607	30

## SDG&E Agricultural Measure Inputs

### SDG&E Electric Measure Inputs

SDG&E Agricultural Electric Measure Inputs								
*Units for all measures are in % of Consumption*								
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
HVAC-Dairies-Dairies-AG-E	HVAC	0.002	0.000	0.002	0.15	0.00011	\$0.10	15
HVAC-Animal Production / CAFOs-Chicken Egg-AG-E	HVAC	0.002	0.000	0.002	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Chicken Meat-AG-E	HVAC	0.002	0.000	0.002	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Poultry Hatcheries-AG-E	HVAC	0.002	0.000	0.002	0.30	0.00011	\$0.21	15
HVAC-Animal Production / CAFOs-Misc. Animal-AG-E	HVAC	0.004	0.000	0.004	0.30	0.00011	\$0.21	15
HVAC-Greenhouses and Nurseries-Floriculture-AG-E	HVAC	0.013	0.000	0.013	0.18	0.00011	\$0.13	15
HVAC-Greenhouses and Nurseries-Mushroom Production-AG-E	HVAC	0.045	0.000	0.045	0.18	0.00011	\$2.77	15
HVAC-Greenhouses and Nurseries-Nurseries & Trees-AG-E	HVAC	0.004	0.000	0.004	0.18	0.00011	\$2.77	15
HVAC-Vineyards and Wineries-Wineries-AG-E	HVAC	0.000	0.000	0.000	0.15	0.00011	\$0.11	15
HVAC-Post Harvest Processing-Cotton Ginning-AG-E	HVAC	0.000	0.000	0.000	0.15	0.00011	\$0.10	15
Lighting-Dairies-Dairies-AG-E	Lighting	0.003	0.000	0.003	0.51	0.00011	\$0.09	15
Lighting-Animal Production / CAFOs-Cattle Feedlots-AG-E	Lighting	0.000	0.000	0.000	0.43	0.00011	\$0.43	15
Lighting-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Lighting	0.001	0.000	0.001	0.43	0.00011	\$0.43	15
Lighting-Animal Production / CAFOs-Chicken Egg-AG-E	Lighting	0.007	0.000	0.007	0.83	0.00011	\$0.15	15
Lighting-Animal Production / CAFOs-Chicken Meat-AG-E	Lighting	0.005	0.000	0.005	0.43	0.00011	\$0.08	15
Lighting-Animal Production / CAFOs-Poultry Hatcheries-AG-E	Lighting	0.005	0.000	0.005	0.63	0.00011	\$0.12	15
Lighting-Animal Production / CAFOs-Misc. Animal-AG-E	Lighting	0.008	0.000	0.008	0.43	0.00011	\$0.08	15
Lighting-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Lighting	0.008	0.000	0.008	0.26	0.00011	\$0.05	15
Lighting-Greenhouses and Nurseries-Floriculture-AG-E	Lighting	0.025	0.000	0.025	0.59	0.00011	\$0.11	15
Lighting-Greenhouses and Nurseries-Mushroom Production-AG-E	Lighting	0.045	0.000	0.045	0.43	0.00011	\$0.08	15
Lighting-Vineyards and Wineries-Wineries-AG-E	Lighting	0.002	0.000	0.002	0.47	0.00011	\$0.09	15
Lighting-Post Harvest Processing-Post Harvest-AG-E	Lighting	0.004	0.000	0.004	0.31	0.00011	\$0.06	15

### SDG&E Agricultural Electric Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Lighting-Post Harvest Processing-Cotton Ginning-AG-E	Lighting	0.000	0.000	0.000	0.31	0.00011	\$0.06	15
Misc-Irrigated Agriculture-Oilseed & Grain Crops-AG-E	Misc	0.001	0.000	0.001	0.26	0.00011	\$0.15	15
Misc-Irrigated Agriculture-Vegetable & Melon Crops-AG-E	Misc	0.002	0.000	0.002	0.26	0.00011	\$0.15	15
Misc-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-E	Misc	0.008	0.000	0.008	0.26	0.00011	\$0.15	15
Misc-Irrigated Agriculture-Misc. Crops-AG-E	Misc	0.007	0.000	0.007	0.26	0.00011	\$0.15	15
Misc.-Animal Production / CAFOs-Cattle Feedlots-AG-E	Misc.	0.000	0.000	0.000	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Misc.	0.004	0.000	0.004	0.35	0.00011	\$0.21	15
Misc.-Animal Production / CAFOs-Chicken Egg-AG-E	Misc.	0.002	0.000	0.002	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Chicken Meat-AG-E	Misc.	0.002	0.000	0.002	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Poultry Hatcheries-AG-E	Misc.	0.001	0.000	0.001	0.10	0.00011	\$0.06	15
Misc.-Animal Production / CAFOs-Misc. Animal-AG-E	Misc.	0.006	0.000	0.006	0.27	0.00011	\$0.16	15
Misc.-Greenhouses and Nurseries-Floriculture-AG-E	Misc.	0.003	0.000	0.003	0.15	0.00011	\$2.31	15
Misc.-Greenhouses and Nurseries-Mushroom Production-AG-E	Misc.	0.013	0.000	0.013	0.15	0.00011	\$2.31	15
Misc.-Greenhouses and Nurseries-Nurseries & Trees-AG-E	Misc.	0.009	0.000	0.009	0.15	0.00011	\$2.31	15
Misc.-Greenhouses and Nurseries-Misc. Greenhouses & Nurseries-AG-E	Misc.	0.026	0.000	0.026	0.15	0.00011	\$2.31	15
Misc.-Post Harvest Processing-Post Harvest-AG-E	Misc.	0.007	0.000	0.007	0.16	0.00011	\$0.09	15
Misc.-Post Harvest Processing-Cotton Ginning-AG-E	Misc.	0.000	0.000	0.000	0.15	0.00011	\$0.09	15
N/A-Misc.-Other Unassigned-AG-E	Misc.	0.014	0.000	0.014	0.15	0.00011	\$0.09	15
Misc. -Dairies-Dairies-AG-E	Misc.	0.005	0.000	0.005	0.20	0.00011	\$0.12	15
Misc. -Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Misc.	0.008	0.000	0.008	0.15	0.00011	\$0.09	15
Misc. -Vineyards and Wineries-Wineries-AG-E	Misc.	0.000	0.000	0.000	0.17	0.00011	\$0.10	15
Misc. -Vineyards and Wineries-Vineyards-AG-E	Misc.	0.000	0.000	0.000	0.24	0.00011	\$0.14	15
Motor-Post Harvest Processing-Post Harvest-AG-E	Motor	0.004	0.000	0.004	0.33	0.00011	\$0.14	15
Motor-Post Harvest Processing-Cotton Ginning-AG-E	Motor	0.001	0.000	0.001	0.31	0.00011	\$0.13	15
Motors-Dairies-Dairies-AG-E	Motors	0.003	0.000	0.003	0.30	0.00011	\$0.12	15

### SDG&E Agricultural Electric Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Motors-Animal Production / CAFOs-Cattle Feedlots-AG-E	Motors	0.002	0.000	0.002	0.36	0.00011	\$0.15	15
Motors-Animal Production / CAFOs-Cattle Ranching & Farming-AG-E	Motors	0.020	0.000	0.020	0.36	0.00011	\$0.15	15
Motors-Animal Production / CAFOs-Misc. Animal-AG-E	Motors	0.004	0.000	0.004	0.36	0.00011	\$0.15	15
Motors-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Motors	0.017	0.000	0.017	0.44	0.00011	\$0.18	15
Motors-Irrigated Agriculture-Oilseed & Grain Crops-AG-E	Motors	0.018	0.000	0.018	0.34	0.00011	\$0.14	15
Motors-Irrigated Agriculture-Vegetable & Melon Crops-AG-E	Motors	0.032	0.000	0.032	0.35	0.00011	\$0.14	15
Motors-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-E	Motors	0.157	0.000	0.157	0.38	0.00011	\$0.16	15
Motors-Irrigated Agriculture-Misc. Crops-AG-E	Motors	0.131	0.000	0.131	0.38	0.00011	\$0.16	15
Motors-Greenhouses and Nurseries-Floriculture-AG-E	Motors	0.016	0.000	0.016	0.29	0.00011	\$0.12	15
Motors-Greenhouses and Nurseries-Mushroom Production-AG-E	Motors	0.026	0.000	0.026	0.29	0.00011	\$0.12	15
Motors-Greenhouses and Nurseries-Nurseries & Trees-AG-E	Motors	0.075	0.000	0.075	0.29	0.00011	\$0.12	15
Motors-Vineyards and Wineries-Wineries-AG-E	Motors	0.001	0.000	0.001	0.20	0.00011	\$0.08	15
Motors-Vineyards and Wineries-Vineyards-AG-E	Motors	0.003	0.000	0.003	0.33	0.00011	\$0.14	15
Process-Animal Production / CAFOs-Misc. Animal-AG-E	Process	0.008	0.000	0.008	0.15	0.00011	\$0.06	15
Process-Vineyards and Wineries-Wineries-AG-E	Process	0.001	0.000	0.001	0.35	0.00011	\$0.14	15
Refrigeration-Dairies-Dairies-AG-E	Refrigeration	0.006	0.000	0.006	0.07	0.00011	\$0.02	15
Refrigeration-Animal Production / CAFOs-Chicken Egg-AG-E	Refrigeration	0.001	0.000	0.001	0.30	0.00011	\$0.07	15
Refrigeration-Animal Production / CAFOs-Chicken Meat-AG-E	Refrigeration	0.002	0.000	0.002	0.15	0.00011	\$0.04	15
Refrigeration-Animal Production / CAFOs-Misc. Animal-AG-E	Refrigeration	0.004	0.000	0.004	0.15	0.00011	\$0.04	15
Refrigeration-Refrigerated Warehouses-Refrigerated Warehouses-AG-E	Refrigeration	0.134	0.000	0.134	0.12	0.00011	\$0.03	15
Refrigeration-Greenhouses and Nurseries-Floriculture-AG-E	Refrigeration	0.006	0.000	0.006	0.42	0.00011	\$6.48	15
Refrigeration-Vineyards and Wineries-Wineries-AG-E	Refrigeration	0.002	0.000	0.002	0.09	0.00011	\$0.02	15
Refrigeration-Post Harvest Processing-Post Harvest-AG-E	Refrigeration	0.021	0.000	0.021	0.48	0.00011	\$0.12	15
Water Heating & Cooling-Vineyards and Wineries-Wineries-AG-E	Water Heating & Cooling	0.001	0.000	0.001	0.15	0.00011	\$0.08	15



### SDG&E Agricultural Electric Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max Savings Fraction	Watts /kWh Ratio	Cost/ Unit	EUL
Water Heating and Cooling-Dairies-Dairies-AG-E	Water Heating and Cooling	0.002	0.000	0.002	0.26	0.00011	\$0.14	15
Water Heating and Cooling-Animal Production / CAFOs-Misc. Animal-AG-E	Water Heating and Cooling	0.006	0.000	0.006	0.04	0.00011	\$0.02	15
Ag-Elec - WB-NC	WB-NC	0.005	0.000	0.005	0.20	0.00011	\$0.06	30

## SDG&E Gas Measure Inputs

SDG&E Agricultural Gas Measure Inputs							
*Units for all measures are in % of Consumption*							
Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction/ 1000	Cost / Unit	EUL
Water Heating and Cooling-Dairies-Dairies-AG-G	Water Heating and Cooling	0.000	0.000	0.000	0.0001966	\$0.0000000	15
Misc. -Dairies-Dairies-AG-G	Misc.	0.000	0.000	0.000	0.0000047	\$0.0000000	15
Misc.-Animal Production / CAFOs-Cattle Feedlots-AG-G	Misc.	0.000	0.000	0.000	0.0000037	\$0.0000009	15
Process-Animal Production / CAFOs-Cattle Feedlots-AG-G	Process	0.001	0.000	0.001	0.0000548	\$0.0000042	15
Water Heating and Cooling-Animal Production / CAFOs-Cattle Feedlots-AG-G	Water Heating and Cooling	0.000	0.000	0.000	0.0000053	\$0.0000002	15
Process-Animal Production / CAFOs-Cattle Ranching & Farming-AG-G	Process	0.000	0.000	0.000	0.0000002	\$0.0000000	15
HVAC-Animal Production / CAFOs-Chicken Egg-AG-G	HVAC	0.001	0.000	0.001	0.0000368	\$0.0000231	15
Water Heating and Cooling-Animal Production / CAFOs-Chicken Egg-AG-G	Water Heating and Cooling	0.000	0.000	0.000	0.0000080	\$0.0000003	15
HVAC-Animal Production / CAFOs-Chicken Meat-AG-G	HVAC	0.002	0.000	0.002	0.0000816	\$0.0000512	15
Process-Animal Production / CAFOs-Chicken Meat-AG-G	Process	0.001	0.000	0.001	0.0000173	\$0.0000013	15
Water Heating and Cooling-Animal Production / CAFOs-Chicken Meat-AG-G	Water Heating and Cooling	0.003	0.000	0.003	0.0000519	\$0.0000018	15
HVAC-Animal Production / CAFOs-Poultry Hatcheries-AG-G	HVAC	0.000	0.000	0.000	0.0000154	\$0.0000097	15
Water Heating and Cooling-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Water Heating and Cooling	0.000	0.000	0.000	0.0000047	\$0.0000002	15
Process-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Process	0.000	0.000	0.000	0.0000064	\$0.0000005	15
Misc.-Animal Production / CAFOs-Poultry Hatcheries-AG-G	Misc.	0.000	0.000	0.000	0.0000064	\$0.0000016	15
HVAC-Animal Production / CAFOs-Misc. Animal-AG-G	HVAC	0.001	0.000	0.001	0.0000219	\$0.0000137	15
Misc.-Animal Production / CAFOs-Misc. Animal-AG-G	Misc.	0.001	0.000	0.001	0.0000326	\$0.0000080	15
Process-Animal Production / CAFOs-Misc. Animal-AG-G	Process	0.001	0.000	0.001	0.0000243	\$0.0000018	15
Water Heating and Cooling-Animal Production / CAFOs-Misc. Animal-AG-G	Water Heating and Cooling	0.001	0.000	0.001	0.0000089	\$0.0000003	15
Misc. -Refrigerated Warehouses-Refrigerated Warehouses-AG-G	Misc.	0.000	0.000	0.000	0.0000045	\$0.0000000	15

## SDG&E Agricultural Gas Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction/ 1000	Cost / Unit	EUL
HVAC-Refrigerated Warehouses-Refrigerated Warehouses-AG-G	HVAC	0.000	0.000	0.000	0.0000767	\$0.0000000	15
Water Heating & Cooling-Refrigerated Warehouses-Refrigerated Warehouses-AG-G	Water Heating & Cooling	0.000	0.000	0.000	0.0000040	\$0.0000000	15
Process-Irrigated Agriculture-Oilseed & Grain Crops-AG-G	Process	0.000	0.000	0.000	0.0000660	\$0.0000025	15
Misc-Irrigated Agriculture-Oilseed & Grain Crops-AG-G	Misc	0.000	0.000	0.000	0.0000079	\$0.0000010	15
Process-Irrigated Agriculture-Vegetable & Melon Crops-AG-G	Process	0.002	0.000	0.002	0.0001775	\$0.0000067	15
Misc-Irrigated Agriculture-Vegetable & Melon Crops-AG-G	Misc	0.000	0.000	0.000	0.0000847	\$0.0000103	15
Process-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-G	Process	0.005	0.000	0.005	0.0005673	\$0.0000213	15
Misc-Irrigated Agriculture-Fruit, Tree & Vine Crops-AG-G	Misc	0.001	0.000	0.001	0.0002706	\$0.0000330	15
Process-Irrigated Agriculture-Misc. Crops-AG-G	Process	0.003	0.000	0.003	0.0002861	\$0.0000108	15
Misc-Irrigated Agriculture-Misc. Crops-AG-G	Misc	0.003	0.000	0.003	0.0007733	\$0.0000944	15
HVAC-Greenhouses and Nurseries-Floriculture-AG-G	HVAC	0.602	0.000	0.602	0.0012571	\$0.0079788	15
Misc.-Greenhouses and Nurseries-Floriculture-AG-G	Misc.	0.032	0.000	0.032	0.0000552	\$0.0003503	15
HVAC-Greenhouses and Nurseries-Mushroom Production-AG-G	HVAC	0.185	0.000	0.185	0.0003950	\$0.0025068	15
Misc.-Greenhouses and Nurseries-Mushroom Production-AG-G	Misc.	0.010	0.000	0.010	0.0000170	\$0.0001079	15
HVAC-Greenhouses and Nurseries-Nurseries & Trees-AG-G	HVAC	0.014	0.000	0.014	0.0000287	\$0.0001824	15
Process-Greenhouses and Nurseries-Nurseries & Trees-AG-G	Process	0.033	0.000	0.033	0.0000314	\$0.0000615	15
Misc.-Greenhouses and Nurseries-Nurseries & Trees-AG-G	Misc.	0.008	0.000	0.008	0.0000144	\$0.0000913	15
Misc.-Greenhouses and Nurseries-Misc. Greenhouses & Nurseries-AG-G	Misc.	0.090	0.000	0.090	0.0002732	\$0.0017340	15
HVAC-Vineyards and Wineries-Wineries-AG-G	HVAC	0.000	0.000	0.000	0.0000486	\$0.0000009	15
Process-Vineyards and Wineries-Wineries-AG-G	Process	0.000	0.000	0.000	0.0007458	\$0.0000016	15
Water Heating & Cooling-Vineyards and Wineries-Wineries-AG-G	Water Heating & Cooling	0.000	0.000	0.000	0.0000616	\$0.0000001	15
Misc. -Vineyards and Wineries-Wineries-AG-G	Misc.	0.000	0.000	0.000	0.0000324	\$0.0000002	15
HVAC-Vineyards and Wineries-Vineyards-AG-G	HVAC	0.000	0.000	0.000	0.0000015	\$0.0000000	15
Process-Vineyards and Wineries-	Process	0.000	0.000	0.000	0.0000066	\$0.0000000	15

## SDG&E Agricultural Gas Measure Inputs

\*Units for all measures are in % of Consumption\*

Measure Name	End Use	Base Density	Efficient Density	Total Density	Max savings Fraction/ 1000	Cost / Unit	EUL
Vineyards-AG-G							
Water Heating & Cooling-Vineyards and Wineries-Vineyards-AG-G	Water Heating & Cooling	0.000	0.000	0.000	0.0000061	\$0.0000000	15
Misc. -Vineyards and Wineries-Vineyards-AG-G	Misc.	0.000	0.000	0.000	0.0000010	\$0.0000000	15
Process-Post Harvest Processing-Post Harvest-AG-G	Process	0.001	0.000	0.001	0.0007483	\$0.0000017	15
Misc.-Post Harvest Processing-Post Harvest-AG-G	Misc.	0.000	0.000	0.000	0.0000644	\$0.0000005	15
Process-Post Harvest Processing-Cotton Ginning-AG-G	Process	0.000	0.000	0.000	0.0000541	\$0.0000001	15
Misc.-Post Harvest Processing-Cotton Ginning-AG-G	Misc.	0.000	0.000	0.000	0.0000021	\$0.0000000	15
Ag-Gas - WB-NC	WB-NC	0.005	0.000	0.005	0.2000000	\$51.6759972	30

## Appendix K – Emerging Technologies

Navigant examined a set of emerging technologies as part of this study to forecast the potential impacts of the next generation of energy efficient technologies. Navigant started by examining a list of approximately 100 technologies. The technologies that were considered are listed in the following table. Not all measures on this list were actually included in the study. Those that were included are listed in the utility-specific measure input charts with their corresponding data values.

Segment	Fuel	End Use	Technology Name
RES	Electric	Clothes Drying	Heat Pump for Clothes Dryer
RES	Electric	HVAC	Ductless Air Conditioning including VRF & Split Systems
RES	Electric	HVAC	Evaporative Cooling
RES	Electric	HVAC	Hot/Dry AC Systems
RES	Electric	HVAC	Improved Zoning Systems - Micro-zoning
RES	Electric	HVAC	Indirect Evaporative Cooling e.g., Coolerado (Res or small Comm)
RES	Electric	HVAC	Residential HVAC for Hot-Dry Climates
RES	Electric	HVAC	Residential Night Ventilation Cooling Field Monitoring Project
RES	Electric	HVAC	Residential Water-Cooled Heat Exchangers for HVAC Equipment
RES	Electric	Lighting	LED light kits for ceiling fans
RES	Electric	Lighting	LED Lighting - Residential
RES	Electric	Lighting	LED Reflectors
RES	Electric	Lighting	Residential CFL Reflectors
RES	Electric	Other	Improved Power-Supply Design
RES	Electric	Other	Plug Load Managing Software/Hardware packages
RES	Gas	Clothes Washing	Adaptive Control Systems
RES	Gas	Clothes Washing	Horizontal Axis with Recirculation
RES	Gas	Clothes Washing	Vertical Axis with Spray Rinse
RES	Gas	Space Heating	Aerosol-Based Duct Sealing
RES	Gas	Water Heating	Air Conditioner Desuperheaters for Water Heating
RES	Gas	Water Heating	Clothes washer with cold water default
RES	Gas	Water Heating	Photovoltaic-Thermal (PVT)
COM and RES	Electric	HVAC	Ice Storage A/C
COM and RES	Electric	HVAC	RESCUE EcoTech CAC Motor Retrofit
COM and RES	Electric	Water Heating	Heat Pump Water Heaters
COM and RES	Electric/gas	Water Heating	Solar Water Heating
COM and RES	Gas	Water Heating	Condensing Gas Water Heater

Segment	Fuel	End Use	Technology Name
COM and RES	Gas	Water Heating	Drain Water Heat Recovery Systems
COM and RES	Gas	Water Heating	Instantaneous Water Heater
COM	Electric	Cooking	Automatic Sash Positioning System
COM	Electric	Cooking	HE Combination Oven
COM	Electric	Cooking	HE convection Oven
COM	Electric	Cooking	HE Deck Oven
COM	Electric	Cooking	HE Food holding Cabinets
COM	Electric	Cooking	HE Pizza Oven
COM	Electric	Cooking	HE Steamers
COM	Electric	Cooking	Pressure Fryer
COM	Electric	Cooling	Liquid Desiccant AC for Grocery Stores
COM	Electric	Cooling	Variable Refrigerant Flow
COM	Electric	Data Centers	Improved Air-Flow Management
COM	Electric	Data Centers	Variable-Speed CRAC Compressors
COM	Electric	Electronics: Data Centers	Improved Data Center Design
COM	Electric	HVAC	Commercial Water-Cooled Heat Exchangers for HVAC Equipment
COM	Electric	HVAC	Electrostatic Anti-Scaling Device for Chiller Water
COM	Electric	Lighting	Advanced HID Lighting - Pulse Start and Ceramic Metal Halide
COM	Electric	Lighting	Advanced Lighting Controls
COM	Electric	Lighting	Commercial Photocells and Timeclocks
COM	Electric	Lighting	Hotel Key Card System with Front Desk Control
COM	Electric	Lighting	Induction / Plasma / Electrodeless Lighting
COM	Electric	Lighting	LED for Street, Area, & Parking Lot Illumination
COM	Electric	Lighting	LED Lighting - Commercial General Illumination
COM	Electric	Lighting	Smart Stairwell/Hallway Lighting (Bi-level LED lighting)
COM	Electric	Lighting	Street lighting network controls
COM	Electric	Lighting	Tubular Daylighting Devices (TDD) aka Daylight pipes
COM	Electric	Lighting: Specialty	LED pool lights
COM	Electric	Other	Commercial Voltage Regulation Products
COM	Electric	Other	Networked Computer Power Management
COM	Electric	Other	Plug Load Managing Software/Hardware packages
COM	Electric	Other	Premium Efficiency Low Voltage Dry-Type Distribution Transformers
COM	Electric	Refrigeration	Efficient Fan Motor Options for Commercial Refrigeration
COM	Electric	Refrigeration	Evaporator Fan Controller for Medium Temperature Walk-Ins
COM	Electric	Refrigeration	Fiber Optic Refrigerated Case Lighting
COM	Electric	Refrigeration	Smart Cool Refrigeration Controller

Segment	Fuel	End Use	Technology Name
COM	Electric	Space and Water Heating	Combined Space and Water Heater
COM	Electric/gas	Cooking	Automatic Kitchen Ventilation Control
COM	Electric/gas	HVAC	Fault Detection and Diagnostics
COM	Gas	Clothes Washing	Laundry Wastewater Recycling
COM	Gas	Cooking	Advanced Gas Fryer
COM	Gas	Cooking	Dishwasher Pre-rinse Vacuum Sink
COM	Gas	Cooking	Finned Cookware (Turbo Pot)
COM	Gas	Cooking	Oven: Efficient Convection Oven with Steam Injection
COM	Gas	Cooking	Ovens: Efficient Impingement Conveyor Ovens
COM	Gas	Cooking	Ultra-low flow pre-rinse spray valves
COM	Gas	Cooking	WOW Oven
COM	Gas	Other	CO2-Based System for Dry Cleaning Fabrics
COM	Gas	Other	Silicone Dry Cleaning
COM	Gas	Pool Heating	Condensing Pool Heaters
COM	Gas	Pool Heating	Heat Pump Pool Heaters
COM	Gas	Space heat	Boiler Thermodynamic Process Control
COM	Gas	Water Heating	Ozonated Washing
IND	Electric	Crosscutting: Lighting	Intelligent LED lighting systems
IND	Electric	Crosscutting: Other	Advanced Compressor Controls
IND	Electric	Crosscutting: Other	Efficient Transformers
IND	Gas	Crosscutting: Boiler	Advanced Steam Trap Systems
IND	Gas	Crosscutting: Boiler	Flue Gas Sensors
IND	Gas	Crosscutting: Combustion	Highly Preheated Combustion Air System
IND	Gas	Crosscutting: Drying	Long Wavelength Catalytic Infrared Drying System
IND	Gas	Crosscutting: Drying	Superheated Steam Drying
IND	Gas	Crosscutting: Furnaces	Flame Image/Intensity Analysis for Natural Gas-Fired Furnaces
IND	Gas	Crosscutting: Furnaces	Improved Heat Transfer / SpyroCor™
IND	Gas	Crosscutting: Furnaces	Reverse-Annulus Single-Ended Radiant Tube (RASERT)
IND	Gas	Crosscutting: Heat Recovery	Absorption Heat Pump/Refrigeration Unit
IND	Gas	Crosscutting: Heat Recovery	Industrial Water Recycling
IND	Gas	Crosscutting: On-Site Generation	Organic Rankine-Cycle Bottoming Unit
IND	Gas	Crosscutting: Other	Steam Vapor Recompression
IND	Gas	Crosscutting: Solar	Solar Industrial Process Heating
IND	Gas	Food	Advanced Food Dryer
IND	Gas	Food	Thermally Driven Heat Pump for Process Heating and Cooling
IND	Gas	Stone, Clay, Glass: General	Reduced Working Temperature for Asphalt

### Emerging Technologies Detailed Input Example

Navigant collected data to characterize emerging technologies used in the potential study. The IOUs responded to data requests from Navigant by providing work papers, case studies, engineering studies, and draft analyses available for the selected emerging technologies. In some cases utility data was not available and Navigant conducted additional research from sources which included manufacturer case studies, third-party case studies, DOE and CEC data, and Navigant's engineering expertise.

The results of this analysis are illustrated in

Table 1 for the PG&E service territory. Specific analysis for each IOU service territory was conducted; however, only PG&E data is displayed here for simplicity. Note that savings and cost are only listed for 2011 values. Navigant expects LED technology to improve (in both efficacy and cost) over time. While

Table 1 only displays a snapshot of the technology at the current time, Navigant did develop and incorporate performance improvement curves and cost reduction curves (illustrated in Figure 1Figure 1) into the potential study model.

**Table 1. Emerging Technology Selected Data (Applicable to PG&E Territory)**

Efficiency Measure	Building Type	Units	Measure Life	Base Tech Density	Efficient Tech Density	Maximum Density	Incremental Equipment Cost	Installation Cost	kWh Savings/unit in 2011	W savings/unit in 2011	Therm Savings in 2011
Condensing Gas Water Heater	SFE	Per Water Heater	15	0.87	0.00	0.87	\$604	\$436	-100.0	-13	54
Ductless Air Conditioning	SFE	Per Home	15	0.44	0.00	0.44	\$525	\$500	112.9	180	0
Evaporative Cooling	SFE	Per Home	15	0.39	0.05	0.44	\$1,496	\$1,848	419.4	589	0
Heat Pump Water Heaters	SFE	Per Home	10	0.09	0.00	0.09	\$750	\$350	1642.9	246	0
Indirect Evaporative Cooling	SFE	Per Home	15	0.44	0.00	0.44	(\$537)	\$1,848	283.5	487	0
LED Lighting 100W Equiv - Indoor	SFE	Lamp	20	1.69	0.00	13.14	\$40	\$3	53.5	5	0
LED Lighting 120W Equiv - Indoor	SFE	Lamp	20	0.21	0.00	2.66	\$48	\$3	64.4	6	0
LED Lighting 40W Equiv - Indoor	SFE	Lamp	20	2.63	0.14	2.77	\$16	\$3	15.2	2	0
LED Lighting 60W Equiv - Indoor	SFE	Lamp	20	10.59	0.14	2.77	\$24	\$3	29.7	3	0
LED Lighting 75W Equiv - Indoor	SFE	Lamp	20	2.33	0.00	13.14	\$30	\$3	42.4	4	0
LED: MR 16 (20W Baseline)	SFE	Lamp	20	0.02	0.01	0.03	\$17	\$0	12.0	0	0
LED: MR 16 (35W Baseline)	SFE	Lamp	20	0.02	0.01	0.03	\$14	\$2	21.0	0	0
LED: PAR 20	SFE	Lamp	20	0.02	0.01	0.02	\$24	\$4	22.0	0	0



Efficiency Measure	Building Type	Units	Measure Life	Base Tech Density	Efficient Tech Density	Maximum Density	Incremental Equipment Cost	Installation Cost	kWh Savings/unit in 2011	W savings/unit in 2011	Therm Savings in 2011
LED: PAR 30 (45-55W Baseline)	SFE	Lamp	20	0.02	0.01	0.02	\$38	\$6	32.0	0	0
LED: PAR 30 (60-70W Baseline)	SFE	Lamp	20	0.02	0.01	0.02	\$38	\$8	37.0	0	0
LED: PAR 38 (50-65W Baseline)	SFE	Lamp	20	0.02	0.01	0.03	\$44	\$10	39.0	0	0
LED: PAR 38 (70-90W Baseline)	SFE	Lamp	20	0.02	0.01	0.03	\$44	\$12	46.0	0	0
LED: Recessed Fixtures	SFE	Lamp	20	0.05	0.01	0.06	\$44	\$14	125.0	1	0
Residential HVAC for Hot-Dry Climates	SFE	Per Home	15	0.44	0.00	0.44	\$246	\$500	126.0	247	0
Residential Night Ventilation Cooling	SFE	Per Home	10	0.15	0.00	0.15	\$493	\$500	200.9	2,340	0
Residential Water-Cooled Heat Exchangers	SFE	Per Home	15	0.44	0.00	0.44	\$2,642	\$500	69.5	376	0
Condensing Gas Water Heater	MFE	Per Water Heater	15	0.87	0.00	0.87	\$604	\$436	-100.0	-13	54
Ductless Air Conditioning	MFE	Per Home	15	0.44	0.00	0.44	\$525	\$500	43.1	115	0
Evaporative Cooling	MFE	Per Home	15	0.39	0.05	0.44	\$1,102	\$722	134.9	453	0
Heat Pump Water Heaters	MFE	Per Home	10	0.09	0.00	0.09	\$750	\$350	624.1	94	0
Indirect Evaporative Cooling	MFE	Per Home	15	0.44	0.00	0.44	\$623	\$722	89.0	392	0
LED Lighting 100W Equiv - Indoor	MFE	Lamp	20	1.69	0.00	7.09	\$40	\$3	53.5	5	0
LED Lighting 120W Equiv - Indoor	MFE	Lamp	20	0.21	0.00	1.44	\$48	\$3	64.4	6	0
LED Lighting 40W Equiv - Indoor	MFE	Lamp	20	1.42	0.07	1.49	\$16	\$3	15.2	2	0
LED Lighting 60W Equiv - Indoor	MFE	Lamp	20	10.59	0.07	1.49	\$24	\$3	29.7	3	0
LED Lighting 75W Equiv - Indoor	MFE	Lamp	20	2.33	0.00	7.09	\$30	\$3	42.4	4	0
LED: MR 16 (20W Baseline)	MFE	Lamp	20	0.02	0.01	0.03	\$17	\$1	12.0	0	0
LED: MR 16 (35W Baseline)	MFE	Lamp	20	0.02	0.01	0.03	\$14	\$3	21.0	0	0
LED: PAR 20	MFE	Lamp	20	0.02	0.01	0.02	\$24	\$5	22.0	0	0
LED: PAR 30 (45-55W Baseline)	MFE	Lamp	20	0.02	0.01	0.02	\$38	\$7	32.0	0	0
LED: PAR 30 (60-70W Baseline)	MFE	Lamp	20	0.02	0.01	0.02	\$38	\$9	37.0	0	0
LED: PAR 38 (50-65W Baseline)	MFE	Lamp	20	0.02	0.01	0.03	\$44	\$11	39.0	0	0
LED: PAR 38 (70-90W Baseline)	MFE	Lamp	20	0.02	0.01	0.03	\$44	\$13	46.0	0	0
Residential HVAC for Hot-Dry Climates	MFE	Per Unit	15	0.44	0.00	0.44	\$246	\$500	48.1	158	0
Residential Water-Cooled Heat Exchangers	MFE	Per Home	15	0.44	0.00	0.44	\$2,642	\$500	26.5	240	0

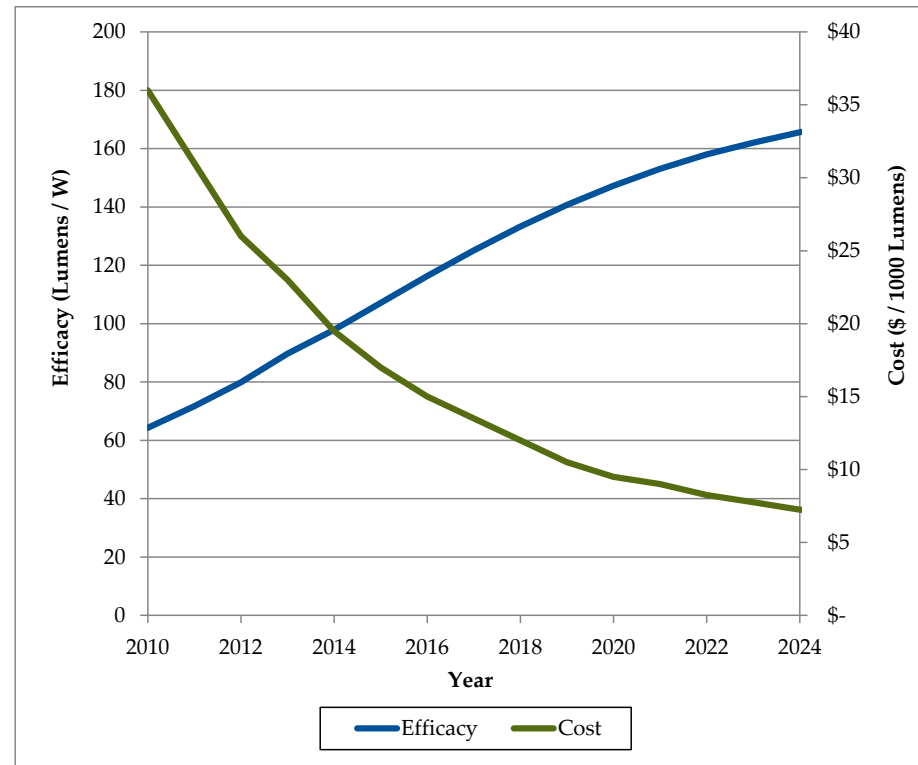
Efficiency Measure	Building Type	Units	Measure Life	Base Tech Density	Efficient Tech Density	Maximum Density	Incremental Equipment Cost	Installation Cost	kWh Savings/unit in 2011	W savings/unit in 2011	Therm Savings in 2011
Warm Mix Asphalt (WMA) **	Ind	Per Asphalt Plant	10	19.20	4.80	24.00	\$39,000	\$11,500	0.0	0	138,600
20W BT-5 Ceramic Metal Halide	COM	Per Fixture	3	2.20	0.02	2.22	\$221	\$0	53.8	11	0
55 Gal Combined Space and Water Heating	COM	Per 1000 sqft	15	0.57	0.01	0.58	\$398	\$0	0.0	0	0
Automatic Steam Trap Monitoring	COM	Per Steam Trap	15	0.11	0.01	0.11	\$975	\$144	0.0	0	345
Comprehensive Commercial HVAC Rooftop Unit Quality Maintenance	COM	Tons	10	0.59	0.18	0.77	\$50	\$8	147.8	0	0
Fault Detection & Diagnostics	COM	Per 1000 sqft	10	0.45	0.05	0.50	\$0	\$0	0.1	0	0
High Performance Rooftop Unit	COM	Tons	15	0.58	0.00	0.58	\$602	\$9	1320.0	269	0
Improved Air-Flow Management**	COM	Per Datacenter	10	105	35	139	\$143,387	\$0	1,023,633	116,853	0
Improved Data Center Design**	COM	Per Datacenter	10	105	35	139	\$1,137,435	\$0	5,686,848	649,184	0
LED Lighting 100W Equiv - Indoor	COM	Lamp	20	0.66	0.01	0.67	\$40	\$0	221.1	6	0
LED Lighting 120W Equiv - Indoor	COM	Lamp	20	0.45	0.00	0.45	\$48	\$0	352.8	8	0
LED Lighting 40W Equiv - Indoor	COM	Lamp	20	0.66	0.01	0.66	\$16	\$0	169.0	3	0
LED Lighting 60W Equiv - Indoor	COM	Lamp	20	0.66	0.01	0.66	\$24	\$0	178.0	4	0
LED Lighting 75W Equiv - Indoor	COM	Lamp	20	0.66	0.01	0.67	\$30	\$0	224.1	5	0
LED Lighting T8 - 4ft Equiv*	COM	Fixture	20	7.19	0.00	7.19	\$165	\$0	-51.2	-1,127	0
LED Lighting T8 - 8ft Equiv*	COM	Fixture	20	1.17	0.00	1.17	\$329	\$0	-24.3	-2,254	0
LED Outdoor Street/Area Lighting**	COM	Per fixture	12	571,649	63,517	635,166	\$747	\$200	340.2	15	0
LED: MR 16 (20W Baseline)	COM	Lamp	11.5	0.03	0.01	0.04	\$17	\$0	48.0	8	0
LED: MR 16 (35W Baseline)	COM	Lamp	11.5	0.03	0.01	0.04	\$14	\$1	84.0	13	0
LED: PAR 20	COM	Lamp	11.2	0.01	0.01	0.02	\$24	\$2	89.0	14	0

Efficiency Measure	Building Type	Units	Measure Life	Base Tech Density	Efficient Tech Density	Maximum Density	Incremental Equipment Cost	Installation Cost	kWh Savings/unit in 2011	W savings/unit in 2011	Therm Savings in 2011
LED: PAR 30 (45-55W Baseline)	COM	Lamp	8.9	0.01	0.01	0.02	\$38	\$3	129.0	20	0
LED: PAR 30 (60-70W Baseline)	COM	Lamp	11.5	0.01	0.01	0.02	\$38	\$4	145.0	22	0
LED: PAR 38 (50-65W Baseline)	COM	Lamp	9.9	0.02	0.01	0.02	\$44	\$5	155.0	24	0
LED: PAR 38 (70-90W Baseline)	COM	Lamp	11.5	0.02	0.01	0.02	\$44	\$6	184.0	28	0
LED: Recessed Fixtures	COM	Lamp	15.4	0.01	0.00	0.01	\$44	\$7	197.0	30	0
Variable Refrigerant Flow (VRF) Chiller	COM	Per Ton	15	3.07	0.03	3.11	\$30	\$0	99.0	50	0
Variable-Speed CRAC Compressors**	COM	Per Datacenter	10	105	35	139	\$483,410	\$0	2,416,910	275,903	0

\* LED commercial lighting does not currently save energy compared to T8 fixtures; however, technology is expected to improve over time and savings will occur from installations in future years. See Figure 1Figure 1.

\*\* Maximum density represents Navigant's estimate for the total number of possible units in the service territory.

**Figure 1. LED Cost and Performance Improvement Curves**



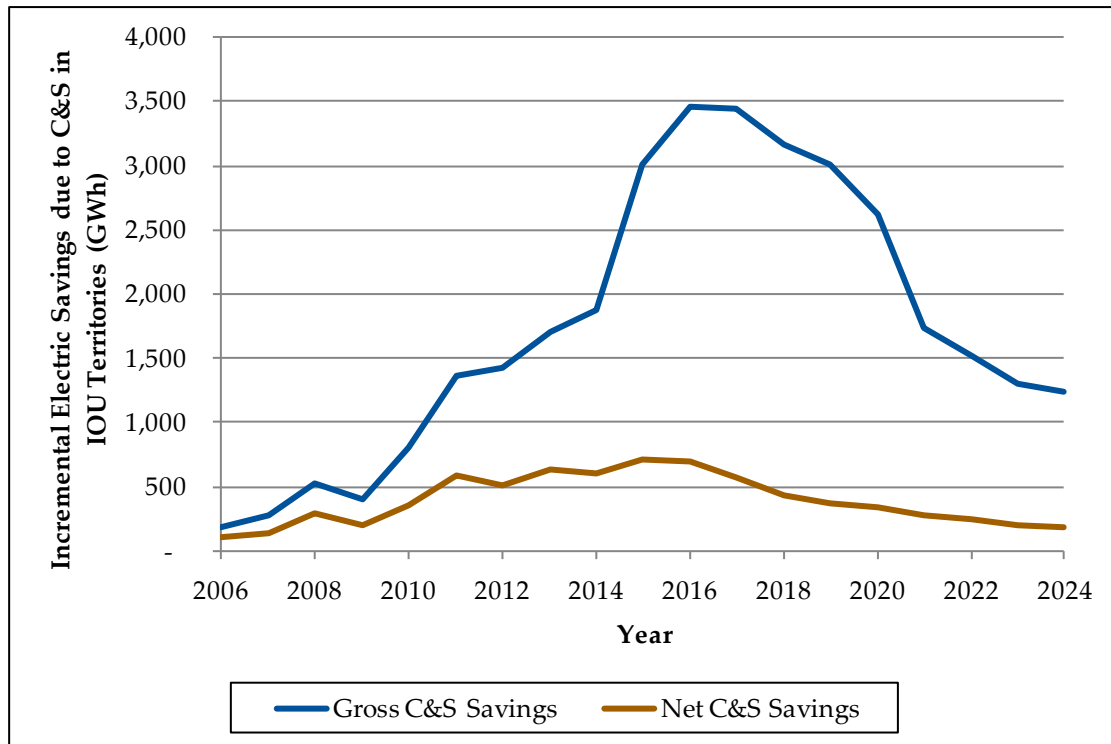
Source: Efficacy Curve obtained from Navigant<sup>1</sup>; cost curve obtained from Bloomberg<sup>2</sup>

<sup>1</sup> Navigant. *Energy Savings Potential of Solid-State Lighting in General Illumination Applications 2010 to 2030*. Prepared for the US Department of Energy. February 2010.

<sup>2</sup> Bloomberg. *LEDs: The Energy Efficiency Game Changer*. New Energy Finance Summit. 2011

## Appendix L - Codes and Standards

This Appendix presents annual gross and net C&S program savings for each IOU from different standards groups. As an overview, the figure below presents the statewide annual gross and net C&S program savings from 2006 to 2024 from all IOUs.



Incremental annual gross C&S program savings increase dramatically between 2009 and 2016, but decrease quickly after 2017. The increase is due to active standard adoption of new state and federal standards. Key contributors to quick ramp-up of annual gross C&S program savings include the following:

- » 2008 Title 24
- » 2008 Title 20 Incandescent lamp standards
- » 2009 Title 20 TV standards
- » 2011 Title 20 Battery Charger standards
- » Federal Appliance standards (Most savings are from reflector and fluorescent lamp standards.)

All appliance standards in the above list have relatively short measure life. High annual savings only last for several years and, therefore, incremental annual gross C&S program savings drop off quickly after 2017.

While trends in the gross C&S savings are interesting to observe, incremental net C&S savings are used to inform IOU goals. The annual net C&S savings follows a similar rise and fall trend. However, net savings includes effects of NOMAD and IOU attribution factors, both of which can significantly reduce

IOU claimable savings. For example, gross savings for federal standards are significant though only about 6% of federal standard savings can be attributed to IOU programs.

The tables below document the detailed energy savings due to codes and standards. Tables show information for net and gross savings including and excluding gas/electric interactive effects. The final numbers used in this study analysis are net savings including interactive effects.

The categories of C&S that appear in the tables are described below.

- » **Track 1 On-the-Book Codes and Standards:** On-the-books standards are those that have already been adopted into law.
- » **Future Title 20 Standards:** IOU C&S programs have developed many Title 20 code change proposals. Several of those proposals are considered by the CEC to have higher priority than others. They are considered as the future Title 20 standards by this potential study.
- » **Future Federal Appliance Standards:** *The IOU Response to Additional Data Request* provided a list of additional federal appliance standards that were not included in the PG&E model for supporting CPUC 2010-2012 evaluation. Among those standards, those that have been adopted or are projected to take effect in 2013 or 2014 are considered as Track 1 Future Federal Appliance Standards.
- » **Future Title 24 Code:** The CEC is in the final rulemaking stage of adopting the 2013 Title 24, which is planned to take effect on January 1, 2014. The 2013 Title 24 is considered as the Track 1 Future Title 24 Code. Energy savings were estimated based on the results of CEC preliminary impact study. Energy savings from future local jurisdiction building reach codes were assumed to be the same as the estimated energy savings for 2012 reach code in the PG&E model.

Table 2 through Table 16 present annual and cumulative net C&S program savings for each IOU and for all IOUs.

**Table 2. PG&E C&S Annual Net Energy Savings – GWh**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	84	0	0	0	84
2011	120	0	0	0	120
2012	153	0	0	0	153
2013	190	0	0	0	190
2014	224	0	1	3	228
2015	257	7	6	11	282
2016	286	17	11	19	333
2017	309	25	17	27	378
2018	327	31	22	35	415
2019	343	36	27	42	448
2020	358	39	32	49	479
2021	372	41	37	56	506
2022	385	42	42	63	533
2023	396	43	47	70	557
2024	406	43	52	77	579
<b>Cumulative Net Energy Savings</b>					
2010	473	0	0	0	473
2011	729	0	0	0	729
2012	950	0	0	0	950
2013	1226	0	0	0	1226
2014	1475	0	3	11	1488
2015	1707	39	15	42	1803
2016	1907	106	28	71	2112
2017	2055	170	40	100	2366
2018	2159	214	52	128	2554
2019	2252	246	64	156	2718
2020	2341	267	75	182	2865
2021	2413	280	85	208	2987
2022	2477	290	96	234	3097
2023	2525	294	107	259	3186
2024	2566	296	118	284	3265

**Table 3. PG&E C&S Annual Net Energy Savings – MW**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	28	0.0	0.0	0.0	28
2011	37	0.0	0.0	0.0	37
2012	33	0.0	0.0	0.0	33
2013	36	0.0	0.0	0.0	36
2014	35	0.0	0.8	2.9	38
2015	33	7.3	5.3	8.4	54
2016	28	9.7	5.3	8.1	52
2017	24	8.0	5.3	7.8	45
2018	18	6.1	5.2	7.6	37
2019	16	4.7	5.1	7.4	33
2020	15	2.8	5.1	7.2	30
2021	13	1.8	5.1	7.1	27
2022	13	1.7	5.1	7.0	26
2023	11	0.8	5.1	6.8	24
2024	10	0.3	5.0	6.8	22
<b>Cumulative Net Energy Savings</b>					
2010	84	0	0	0	84
2011	120	0	0	0	120
2012	153	0	0	0	153
2013	190	0	0	0	190
2014	224	0	1	3	228
2015	257	7	6	11	282
2016	286	17	11	19	333
2017	309	25	17	27	378
2018	327	31	22	35	415
2019	343	36	27	42	448
2020	358	39	32	49	479
2021	372	41	37	56	506
2022	385	42	42	63	533
2023	396	43	47	70	557
2024	406	43	52	77	579



**Table 4. PG&E C&S Annual Net Energy Savings – MMT (without interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	1.94	0.00	0.00	0.00	1.94
2011	2.97	0.00	0.00	0.00	2.97
2012	2.88	0.00	0.00	0.00	2.88
2013	2.79	0.00	0.01	0.00	2.80
2014	2.69	0.00	0.01	0.25	2.95
2015	2.53	0.00	0.02	0.72	3.28
2016	2.44	0.00	0.03	0.69	3.16
2017	2.36	0.00	0.03	0.67	3.06
2018	2.33	0.00	0.03	0.65	3.01
2019	2.30	0.00	0.03	0.64	2.97
2020	2.28	0.00	0.03	0.62	2.93
2021	1.81	0.00	0.03	0.61	2.45
2022	1.80	0.00	0.03	0.60	2.42
2023	1.79	0.00	0.03	0.59	2.40
2024	1.78	0.00	0.02	0.58	2.38
<b>Cumulative Net Energy Savings</b>					
2010	4.8	0.0	0.0	0.0	4.8
2011	7.8	0.0	0.0	0.0	7.8
2012	10.7	0.0	0.0	0.0	10.7
2013	13.5	0.0	0.0	0.0	13.5
2014	16.2	0.0	0.0	0.2	16.4
2015	18.7	0.0	0.0	1.0	19.7
2016	21.1	0.0	0.1	1.7	22.9
2017	23.5	0.0	0.1	2.3	25.9
2018	25.8	0.0	0.1	3.0	28.9
2019	28.1	0.0	0.2	3.6	31.9
2020	30.4	0.0	0.2	4.2	34.8
2021	32.2	0.0	0.2	4.9	37.3
2022	34.0	0.0	0.2	5.4	39.7
2023	35.8	0.0	0.3	6.0	42.1
2024	37.6	0.0	0.3	6.6	44.5

**Table 5. PG&E C&S Annual Net Energy Savings – MMT (with interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	0.95	0.00	0.00	0.00	0.95
2011	1.37	0.00	0.00	0.00	1.37
2012	1.61	0.00	0.00	0.00	1.61
2013	1.11	0.00	0.01	0.00	1.12
2014	1.32	0.00	0.00	0.25	1.57
2015	1.27	-0.25	-0.04	0.72	1.70
2016	1.28	-0.48	-0.03	0.69	1.47
2017	1.59	-0.45	-0.03	0.67	1.78
2018	1.75	-0.27	-0.03	0.65	2.11
2019	1.86	-0.16	-0.02	0.64	2.31
2020	1.86	-0.09	-0.02	0.62	2.38
2021	1.52	-0.02	-0.02	0.61	2.08
2022	1.58	0.00	-0.02	0.60	2.15
2023	1.66	0.00	-0.02	0.59	2.22
2024	1.69	0.00	-0.02	0.58	2.24
<b>Cumulative Net Energy Savings</b>					
2010	1.8	0.0	0.0	0.0	1.8
2011	3.1	0.0	0.0	0.0	3.1
2012	4.7	0.0	0.0	0.0	4.7
2013	5.9	0.0	0.0	0.0	5.9
2014	7.2	0.0	0.0	0.2	7.4
2015	8.4	-0.3	0.0	1.0	9.1
2016	9.7	-0.7	-0.1	1.7	10.6
2017	11.3	-1.2	-0.1	2.3	12.4
2018	13.1	-1.5	-0.1	3.0	14.5
2019	14.9	-1.6	-0.1	3.6	16.8
2020	16.8	-1.7	-0.2	4.2	19.2
2021	18.3	-1.7	-0.2	4.9	21.3
2022	19.9	-1.7	-0.2	5.4	23.4
2023	21.5	-1.7	-0.2	6.0	25.6
2024	23.2	-1.7	-0.2	6.6	27.9

**Table 6. SCE C&S Annual Net Energy Savings – GWh**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	159	0	0.0	0.0	159
2011	264	0	0.0	0.0	264
2012	228	0	0.0	0.0	228
2013	285	0	0.2	0.0	285
2014	257	0	2.6	11.0	270
2015	240	41	12.8	31.8	325
2016	206	69	13.0	30.8	319
2017	153	65	12.9	29.8	261
2018	107	46	12.5	28.9	195
2019	96	32	11.7	28.2	168
2020	91	22	11.2	27.5	152
2021	74	13	11.2	27.0	126
2022	66	10	11.2	26.5	113
2023	50	5	11.1	26.1	92
2024	42	2	11.0	25.7	81
<b>Cumulative Net Energy Savings</b>					
2010	488	0	0	0	488
2011	752	0	0	0	752
2012	980	0	0	0	980
2013	1265	0	0	0	1265
2014	1521	0	3	11	1535
2015	1761	41	16	43	1860
2016	1967	110	29	74	2179
2017	2120	175	41	103	2440
2018	2227	221	54	132	2635
2019	2323	253	66	161	2803
2020	2415	276	77	188	2955
2021	2489	289	88	215	3081
2022	2555	299	99	242	3195
2023	2605	304	110	268	3287
2024	2647	306	121	293	3367

**Table 7. SCE C&S Annual Net Energy Savings – MW**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	29	0.0	0.0	0.0	29
2011	38	0.0	0.0	0.0	38
2012	34	0.0	0.0	0.0	34
2013	37	0.0	0.0	0.0	37
2014	36	0.0	0.8	3.0	40
2015	34	7.5	5.5	8.6	56
2016	29	10.0	5.5	8.3	53
2017	25	8.3	5.5	8.1	46
2018	18	6.3	5.4	7.8	38
2019	16	4.9	5.3	7.6	34
2020	16	2.9	5.2	7.5	31
2021	14	1.9	5.2	7.3	28
2022	13	1.7	5.2	7.2	27
2023	12	0.8	5.2	7.1	25
2024	11	0.3	5.2	7.0	23
<b>Cumulative Net Energy Savings</b>					
2010	86	0	0	0	86
2011	124	0	0	0	124
2012	158	0	0	0	158
2013	195	0	0	0	195
2014	231	0	1	3	235
2015	265	8	6	12	291
2016	295	18	12	20	344
2017	319	26	17	28	390
2018	337	32	23	36	428
2019	354	37	28	43	462
2020	370	40	33	51	494
2021	384	42	38	58	522
2022	397	44	44	65	549
2023	408	44	49	72	574
2024	419	45	54	79	597

**Table 8. SCG C&S Annual Net Energy Savings – MMT (without interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	3.14	0.00	0.00	0.00	3.14
2011	4.91	0.00	0.00	0.00	4.91
2012	4.76	0.00	0.00	0.00	4.76
2013	4.61	0.00	0.01	0.00	4.63
2014	4.44	0.00	0.02	0.43	4.90
2015	4.20	0.00	0.04	1.25	5.49
2016	4.05	0.00	0.04	1.21	5.30
2017	3.92	0.00	0.04	1.17	5.13
2018	3.87	0.00	0.04	1.14	5.05
2019	3.83	0.00	0.04	1.11	4.98
2020	3.79	0.00	0.04	1.08	4.91
2021	3.04	0.00	0.04	1.06	4.14
2022	3.02	0.00	0.04	1.04	4.10
2023	3.00	0.00	0.04	1.02	4.06
2024	2.98	0.00	0.04	1.01	4.03
<b>Cumulative Net Energy Savings</b>					
2010	13.7	0.0	0.0	0.0	13.7
2011	22.8	0.0	0.0	0.0	22.8
2012	32.1	0.0	0.0	0.0	32.1
2013	41.4	0.0	0.3	0.0	41.7
2014	50.6	0.0	0.7	0.9	52.3
2015	59.8	0.0	1.5	3.6	65.0
2016	69.0	0.0	2.5	6.3	77.8
2017	78.1	0.0	3.5	9.0	90.6
2018	87.3	0.0	4.4	11.7	103
2019	96.5	0.0	5.4	14.4	116
2020	105.6	0.0	6.4	17.1	129
2021	113.4	0.0	7.3	19.8	141
2022	121.1	0.0	8.3	22.5	152
2023	128.9	0.0	9.2	25.2	163
2024	136.7	0.0	10.1	27.9	175

**Table 9. SDG&E C&S Annual Net Energy Savings – GWh**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	36	0	0.0	0.0	36
2011	60	0	0.0	0.0	60
2012	52	0	0.0	0.0	52
2013	65	0	0.0	0.0	65
2014	58	0	0.6	2.5	61
2015	54	9	2.9	7.2	74
2016	47	16	3.0	7.0	72
2017	35	15	2.9	6.8	59
2018	24	10	2.8	6.6	44
2019	22	7	2.6	6.4	38
2020	21	5	2.5	6.2	35
2021	17	3	2.5	6.1	29
2022	15	2	2.5	6.0	26
2023	11	1	2.5	5.9	21
2024	9	0	2.5	5.8	18
<b>Cumulative Net Energy Savings</b>					
2010	111	0	0	0	111
2011	171	0	0	0	171
2012	222	0	0	0	222
2013	287	0	0	0	287
2014	345	0	1	3	348
2015	400	9	4	10	422
2016	446	25	6	17	494
2017	481	40	9	23	554
2018	505	50	12	30	598
2019	527	58	15	36	636
2020	548	63	17	43	671
2021	565	66	20	49	699
2022	580	68	23	55	725
2023	591	69	25	61	746
2024	601	69	28	67	764

**Table 10. SDG&E C&S Annual Net Energy Savings – MW**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	6.5	0.0	0.0	0.0	6.5
2011	8.6	0.0	0.0	0.0	8.6
2012	7.8	0.0	0.0	0.0	7.8
2013	8.4	0.0	0.0	0.0	8.4
2014	8.1	0.0	0.2	0.7	9.0
2015	7.7	1.7	1.2	2.0	12.6
2016	6.7	2.3	1.2	1.9	12.1
2017	5.6	1.9	1.2	1.8	10.5
2018	4.2	1.4	1.2	1.8	8.6
2019	3.7	1.1	1.2	1.7	7.8
2020	3.6	0.7	1.2	1.7	7.1
2021	3.1	0.4	1.2	1.7	6.4
2022	3.0	0.4	1.2	1.6	6.2
2023	2.7	0.2	1.2	1.6	5.6
2024	2.4	0.1	1.2	1.6	5.2
<b>Cumulative Net Energy Savings</b>					
2010	19.6	0.0	0.0	0.0	19.6
2011	28.2	0.0	0.0	0.0	28.2
2012	35.9	0.0	0.0	0.0	35.9
2013	44.4	0.0	0.0	0.0	44.4
2014	52.5	0.0	0.2	0.7	53.3
2015	60.2	1.7	1.4	2.6	66.0
2016	66.8	4.0	2.7	4.5	78.0
2017	72.4	5.9	3.9	6.4	88.5
2018	76.6	7.3	5.1	8.1	97.1
2019	80.3	8.4	6.3	9.9	104.9
2020	83.9	9.0	7.5	11.6	112.0
2021	87.1	9.5	8.7	13.2	118.5
2022	90.0	9.9	9.9	14.8	124.6
2023	92.7	10.1	11.1	16.4	130.3
2024	95.1	10.1	12.3	18.0	135.5

**Table 11. SDG&E C&S Annual Net Energy Savings – MMT (without interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	0.22	0.00	0.00	0.00	0.22
2011	0.34	0.00	0.00	0.00	0.34
2012	0.33	0.00	0.00	0.00	0.33
2013	0.32	0.00	0.00	0.00	0.32
2014	0.31	0.00	0.00	0.03	0.34
2015	0.29	0.00	0.00	0.08	0.37
2016	0.28	0.00	0.00	0.08	0.36
2017	0.27	0.00	0.00	0.08	0.35
2018	0.26	0.00	0.00	0.07	0.34
2019	0.26	0.00	0.00	0.07	0.34
2020	0.26	0.00	0.00	0.07	0.33
2021	0.21	0.00	0.00	0.07	0.28
2022	0.20	0.00	0.00	0.07	0.28
2023	0.20	0.00	0.00	0.07	0.27
2024	0.20	0.00	0.00	0.07	0.27
<b>Cumulative Net Energy Savings</b>					
2010	0.5	0.0	0.0	0.0	0.5
2011	0.9	0.0	0.0	0.0	0.9
2012	1.2	0.0	0.0	0.0	1.2
2013	1.5	0.0	0.0	0.0	1.5
2014	1.8	0.0	0.0	0.0	1.9
2015	2.1	0.0	0.0	0.1	2.2
2016	2.4	0.0	0.0	0.2	2.6
2017	2.7	0.0	0.0	0.3	2.9
2018	2.9	0.0	0.0	0.3	3.3
2019	3.2	0.0	0.0	0.4	3.6
2020	3.5	0.0	0.0	0.5	4.0
2021	3.7	0.0	0.0	0.6	4.2
2022	3.9	0.0	0.0	0.6	4.5
2023	4.1	0.0	0.0	0.7	4.8
2024	4.3	0.0	0.0	0.8	5.1



**Table 12. SDG&E C&S Annual Net Energy Savings – MMT (with interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	0.11	0.00	0.00	0.00	0.11
2011	0.16	0.00	0.00	0.00	0.16
2012	0.18	0.00	0.00	0.00	0.18
2013	0.13	0.00	0.00	0.00	0.13
2014	0.15	0.00	0.00	0.03	0.18
2015	0.14	-0.03	0.00	0.08	0.19
2016	0.15	-0.05	0.00	0.08	0.17
2017	0.18	-0.05	0.00	0.08	0.20
2018	0.20	-0.03	0.00	0.07	0.24
2019	0.21	-0.02	0.00	0.07	0.26
2020	0.21	-0.01	0.00	0.07	0.27
2021	0.17	0.00	0.00	0.07	0.24
2022	0.18	0.00	0.00	0.07	0.24
2023	0.19	0.00	0.00	0.07	0.25
2024	0.19	0.00	0.00	0.07	0.26
<b>Cumulative Net Energy Savings</b>					
2010	0.20	0.00	0.00	0.00	0.20
2011	0.36	0.00	0.00	0.00	0.36
2012	0.54	0.00	0.00	0.00	0.54
2013	0.67	0.00	0.00	0.00	0.67
2014	0.82	0.00	0.00	0.03	0.85
2015	0.96	-0.03	0.00	0.11	1.04
2016	1.11	-0.08	-0.01	0.19	1.20
2017	1.29	-0.13	-0.01	0.27	1.41
2018	1.49	-0.17	-0.01	0.34	1.65
2019	1.70	-0.18	-0.02	0.41	1.91
2020	1.91	-0.19	-0.02	0.48	2.18
2021	2.08	-0.20	-0.02	0.55	2.42
2022	2.26	-0.20	-0.02	0.62	2.66
2023	2.45	-0.20	-0.03	0.69	2.91
2024	2.64	-0.20	-0.03	0.75	3.17

**Table 13. ALL IOU C&S Annual Net Energy Savings – GWh**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	350	0	0.0	0.0	350
2011	580	0	0.0	0.0	580
2012	501	0	0.0	0.0	501
2013	626	0	0.3	0.0	626
2014	563	0	5.7	24.2	593
2015	526	89	28.1	69.9	714
2016	452	152	28.6	67.6	700
2017	336	143	28.4	65.5	573
2018	236	101	27.5	63.6	428
2019	211	71	25.6	61.9	370
2020	201	49	24.7	60.5	335
2021	163	29	24.6	59.2	276
2022	144	22	24.6	58.2	249
2023	110	10	24.4	57.3	202
2024	92	4	24.2	56.5	177
<b>Cumulative Net Energy Savings</b>					
2010	1071	0	0	0	1071
2011	1651	0	0	0	1651
2012	2152	0	0	0	2152
2013	2778	0	0	0	2778
2014	3341	0	6	24	3372
2015	3868	89	34	94	4085
2016	4320	241	63	162	4786
2017	4656	385	91	227	5359
2018	4892	485	119	291	5787
2019	5103	557	144	353	6157
2020	5304	606	169	413	6491
2021	5467	635	194	472	6768
2022	5611	657	218	531	7017
2023	5721	667	243	588	7219
2024	5813	672	267	644	7396

**Table 14. All IOU C&S Annual Net Energy Savings – MW**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	63	0	0	0	63
2011	83	0	0	0	83
2012	75	0	0	0	75
2013	82	0	0	0	82
2014	78	0	2	7	87
2015	75	17	12	19	122
2016	64	22	12	18	117
2017	54	18	12	18	102
2018	40	14	12	17	83
2019	36	11	12	17	75
2020	35	6	12	16	69
2021	30	4	12	16	62
2022	29	4	11	16	60
2023	26	2	11	16	55
2024	23	1	11	15	50
<b>Cumulative Net Energy Savings</b>					
2010	189	0	0	0	189
2011	273	0	0	0	273
2012	348	0	0	0	348
2013	429	0	0	0	429
2014	508	0	2	7	516
2015	583	17	14	25	638
2016	647	39	26	44	755
2017	701	57	38	62	857
2018	741	71	50	79	940
2019	777	81	61	95	1015
2020	812	88	73	112	1084
2021	843	92	84	128	1147
2022	871	96	96	144	1206
2023	897	97	107	159	1261
2024	920	98	119	174	1312

**Table 15. All IOU C&S Annual Net Energy Savings – MMT (without interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	5.3	0.0	0.0	0.0	5.3
2011	8.1	0.0	0.0	0.0	8.1
2012	7.8	0.0	0.0	0.0	7.8
2013	7.6	0.0	0.0	0.0	7.6
2014	7.3	0.0	0.0	0.7	8.0
2015	6.9	0.0	0.1	2.0	8.9
2016	6.6	0.0	0.1	1.9	8.6
2017	6.4	0.0	0.1	1.8	8.3
2018	6.3	0.0	0.1	1.8	8.2
2019	6.3	0.0	0.1	1.7	8.1
2020	6.2	0.0	0.1	1.7	8.0
2021	4.9	0.0	0.1	1.7	6.6
2022	4.9	0.0	0.1	1.6	6.6
2023	4.9	0.0	0.1	1.6	6.5
2024	4.8	0.0	0.1	1.6	6.5
<b>Cumulative Net Energy Savings</b>					
2010	13	0	0	0	13
2011	21	0	0	0	21
2012	29	0	0	0	29
2013	37	0	0	0	37
2014	44	0	0	1	45
2015	51	0	0	3	53
2016	57	0	0	5	62
2017	64	0	0	6	70
2018	70	0	0	8	79
2019	76	0	0	10	87
2020	83	0	0	12	95
2021	87	0	1	13	101
2022	92	0	1	15	108
2023	97	0	1	16	114
2024	102	0	1	18	121

**Table 16. All IOU C&S Annual Net Energy Savings – MMT (with interactive effects)**

Year	Track 1 On-the-Books Standards	Track 1 Future Title 20	Track 1 Future Federal Appliance	Track 1 Future Title 24	Total
<b>Annual Net Energy Savings</b>					
2010	2.6	0.0	0.0	0.0	2.6
2011	3.7	0.0	0.0	0.0	3.7
2012	4.4	0.0	0.0	0.0	4.4
2013	3.0	0.0	0.0	0.0	3.0
2014	3.6	0.0	0.0	0.7	4.3
2015	3.4	-0.7	-0.1	2.0	4.6
2016	3.5	-1.3	-0.1	1.9	4.0
2017	4.3	-1.2	-0.1	1.8	4.8
2018	4.8	-0.7	-0.1	1.8	5.7
2019	5.0	-0.4	-0.1	1.7	6.3
2020	5.1	-0.2	-0.1	1.7	6.4
2021	4.1	-0.1	-0.1	1.7	5.7
2022	4.3	0.0	-0.1	1.6	5.8
2023	4.5	0.0	-0.1	1.6	6.0
2024	4.6	0.0	-0.1	1.6	6.1
<b>Cumulative Net Energy Savings</b>					
2010	4.8	0.0	0.0	0.0	4.8
2011	8.5	0.0	0.0	0.0	8.5
2012	12.9	0.0	0.0	0.0	12.9
2013	15.9	0.0	0.0	0.0	15.9
2014	19.5	0.0	0.0	0.7	20.2
2015	22.9	-0.7	-0.1	2.6	24.8
2016	26.4	-2.0	-0.2	4.5	28.8
2017	30.7	-3.2	-0.2	6.3	33.6
2018	35.5	-4.0	-0.3	8.1	39.3
2019	40.5	-4.4	-0.4	9.8	45.6
2020	45.6	-4.6	-0.4	11.5	52.1
2021	49.7	-4.7	-0.5	13.2	57.7
2022	54.0	-4.7	-0.6	14.8	63.6
2023	58.5	-4.7	-0.6	16.4	69.6
2024	63.1	-4.7	-0.7	18.0	75.7

## C&S Impact to Voluntary Programs

### Impact Calculation Methods

A new energy efficiency standard may reduce the energy savings from an affected incentive program measure if the baseline efficiency is increased by the standard. The energy savings impact is quantified as the ratio of measure unit energy savings (UES) under the new standard to the UES using the 2007 baseline efficiency, as shown in the following equation:

$$\text{Impact Percentage}_{\text{year}} = \frac{\text{UES under new standard}}{\text{UES under the 2007 baseline}}$$

Impact percentages vary by year because standards take effect in different years. Therefore, a vector of impact percentages was developed for each incentive program measure to capture the impact in each year from 2010 to 2024. For incentive program measures not affected by any new standards, values of the impact percentages are 100%. C&S impact vectors are used as the input to the EERAM model to assess the total impact of new state and federal standards to potentials of incentive programs.

There are two ways to calculate impact percentages based on the types of efficiency metric used for the affected measure. The first calculation method is used for measures with an efficiency metric based on energy usage rating, e.g. light bulb wattage rating. We assumed that neither program measures nor standards would change operation schedules. The C&S impact percentage is calculated as:

$$\text{Impact Percentage}_{\text{year}} = \frac{\text{Power}_{\text{New Standard}} - \text{Power}_{\text{Program Measure}}}{\text{Power}_{\text{Baseline}} - \text{Power}_{\text{Program Measure}}}$$

The second calculation method is used for measures with an efficiency or efficacy measurement, e.g. clothes washer energy factor (cycles/kWh). In this case, we assumed the annual loads, e.g. cooling/heating loads or clothes washing loads, were the same under existing and new standards. The following equation is used to determine these impact percentages:

$$\begin{aligned} \text{Impact Percentage}_{\text{year}} &= \frac{\text{Load} / \eta_{\text{New Standard}} - \text{Load} / \eta_{\text{Program Measure}}}{\text{Load} / \eta_{\text{Baseline}} - \text{Load} / \eta_{\text{Program Measure}}} \\ &= \frac{1 / \eta_{\text{New Standard}} - 1 / \eta_{\text{Program Measure}}}{1 / \eta_{\text{Baseline}} - 1 / \eta_{\text{Program Measure}}} \end{aligned}$$

In the above equations, the baseline technology efficiency ratings,  $\text{Power}_{\text{Baseline}}$  and  $\eta_{\text{Baseline}}$ , are based on effective standards in baseline year of 2007 or average market practices, if there was not an applicable efficiency standard in 2007.

The following sections provide the detailed energy efficiency data and impact percentages for EERAM measures that are affected by new standards that become effective after 2007.

### C&S Impact Vectors

Table 17 through Table 20 summarize the C&S impact vectors for EERAM measures in residential electric, residential gas, commercial electric, and commercial gas sectors, respectively. Only measures affected by C&S updates are listed in these tables. For each measure, a reference to the table, which contains detailed standard and measure efficiency data, is provided.

**Table 17. C&S Impact Vectors for Residential Electric Measures**

EERAM Measure	Standard Data	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ES Refrigerator	Table 21	100%	100%	100%	100%	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%
ES Dishwasher	Table 22	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
ES Freezer	Table 23	100%	100%	100%	100%	24%	24%	24%	24%	24%	24%	24%	24%	24%	24%	24%	24%
ES Room AC	Table 24	100%	100%	100%	100%	52%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%
Rooftop or split system – SEER 15	Table 27	100%	100%	100%	100%	100%	46%	46%	46%	46%	46%	46%	46%	46%	46%	46%	46%
Rooftop or split system – SEER 18	Table 27	100%	100%	100%	100%	100%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%
ES Clothes washer	Table 25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LED Lighting <=7W - Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: <=7W Screw-In Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 13W - Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 13W Screw-In Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 18W Screw-In Indoor	Table 28	93%	93%	61%	61%	61%	61%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 23W Screw-In Indoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: >25W Screw-In Indoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%

EERAM Measure	Standard Data	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
CFL Fixture	Table 28	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 7W - Outdoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 7W Screw-In Outdoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 13W - Outdoor	Table 28	94%	94%	94%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 13W Screw-In Outdoor	Table 28	94%	94%	94%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 18W Screw-In Outdoor	Table 28	93%	93%	61%	61%	61%	61%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 23W Screw-In Outdoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: >25W Screw-In Outdoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
EnergyStar LCD/Plasma TVs	Table 26	100%	94%	94%	88%	88%	88%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%
WB - NC - 15%		100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WB - NC - 25%		100%	40%	40%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WB - NC - 30%		100%	50%	50%	50%	17%	17%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Residential HVAC for Hot-Dry Climates	Table 27	100%	100%	100%	100%	100%	46%	46%	46%	46%	46%	46%	46%	46%	46%	46%	46%
Evaporative Cooling (Swamp Cooler)	Table 27	100%	100%	100%	100%	100%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%
Indirect Evaporative Cooling e.g., Coolerado	Table 27	100%	100%	100%	100%	100%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
Ductless Air Conditioning including VRF & Split Systems	Table 27	100%	100%	100%	100%	100%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%
Residential Water-Cooled	Table 27	100%	100%	100%	100%	100%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%



EERAM Measure	Standard Data	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Heat Exchangers for HVAC Equipment																	

**Table 18. C&S Impact Vectors for Residential Gas Measures**

EERAM Measure	Standard Data Table	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
High Efficiency Furnace	Table 29	100%	100%	100%	89%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
High Efficiency Space heating boiler	Table 30	100%	100%	100%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%
High Efficiency Water Heater	Table 31	100%	100%	100%	100%	100%	79%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
High Efficiency Pool Heater	Table 32	100%	100%	100%	52%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
ES Dishwasher	Table 22	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
WB - NC - 15%		100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WB - NC - 25%		100%	40%	40%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WB - NC - 30%		100%	50%	50%	50%	17%	17%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%

**Table 19. C&S Impact Vectors for Commercial Electric Measures**

EERAM Measure	Standard Data Table	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Convection Oven	Footnote <sup>3</sup>	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Refrigerator Glass Doors	Table 35	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
Packaged A/C (<65k 15 SEER)	Table 27	100%	100%	100%	100%	100%	46%	46%	46%	46%	46%	46%	46%	46%	46%	46%	46%
PS Interior HID - Incandescent Base > 150W	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
PS Interior HID - Incandescent Base <= 150W	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL Fixture Under 15W	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL Fixture 16 to 24W	Table 28	93%	93%	61%	61%	61%	61%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%
CFL Fixture Over 24W	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
PS Exterior HID - Incandescent Base > 150W	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
PS Exterior HID - Incandescent Base <= 150W	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: <=7W Screw-In Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 13W Screw-In Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 18W Screw-In Indoor	Table 28	93%	93%	61%	61%	61%	61%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: 23W Screw-In Indoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
CFL: >25W Screw-In Indoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 40W Equiv - Indoor	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 60W Equiv -	Table 28	94%	94%	94%	67%	67%	67%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%

<sup>3</sup> The IOU C&S program is developing a Title 20 proposal to recommend the adoption of Energy Star criteria for convection ovens as the Californian appliance efficiency standard. The effective date for the new standard is estimated to be January 1, 2015.

EERAM Measure	Standard Data Table	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Indoor																	
LED Lighting 75W Equiv - Indoor	Table 28	93%	93%	61%	61%	61%	61%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 100W Equiv - Indoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
LED Lighting 120W Equiv - Indoor	Table 28	94%	64%	64%	64%	64%	64%	64%	64%	0%	0%	0%	0%	0%	0%	0%	0%
T12 to T8 - 4ft	Table 33	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
T12 to T8 - 8ft	Table 33	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Linear fluorescent delamping - 4ft	Table 33	100%	100%	100%	100%	75%	50%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Linear fluorescent delamping - 8ft	Table 33	100%	100%	100%	100%	75%	50%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%

**Table 20. C&S Impact Vectors for Commercial Gas Measures**

EERAM Measure	Standard Data Table	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Convection Oven	Footnote <sup>4</sup>	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Space Heating Boiler 85% Efficient	Table 34	100%	100%	86%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Space Heating Boiler 95% Efficient	Table 34	100%	100%	95%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Pool Heater - 84% or more efficient	Table 32	100%	100%	100%	100%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%

<sup>4</sup> The IOU C&S program is developing a Title 20 proposal to recommend the adoption of Energy Star criteria for convection ovens as the Californian appliance efficiency standard. The estimated new standard effective date is January 1, 2015.

**Table 21. Impact Percentages for Energy Star Refrigerators**

Measure Type	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	Energy Star <sup>2</sup>	DOE <sup>3</sup> (Effective 1/1/2014)	
Efficiency Metric	Maximum Energy Use (kwh/year)			
Refrigerators and Refrigerator-Freezers with manual defrost	429	343	389	53%
Refrigerator-Freezer – partial automatic defrost	477	343	389	34%
Refrigerator-Freezers – automatic defrost with top-mounted freezer without through-the-door ice service and all refrigerators – automatic defrost	608	382	399	8%
Refrigerator-Freezers – automatic defrost with side-mounted freezer without through-the-door ice service	553	487	472	0%
Refrigerator-Freezers – automatic defrost with bottom-mounted freezer	565	443	498	46%
Refrigerator-Freezers – automatic defrost with top-mounted freezer with through-the-door ice service	565	452	558	93%
Refrigerator-Freezers – automatic defrost with side-mounted freezer with through-the-door ice service	613	490	608	96%
Compact Refrigerators and Refrigerator-Freezers with manual defrost	518	415	437	22%
Compact Refrigerator-Freezers – partial automatic defrost	542	433	457	22%
Compact Refrigerator-Freezers – automatic defrost with top-mounted freezer and compact all refrigerators – automatic defrost	615	492	581	75%
Compact Refrigerator-Freezers – automatic defrost with side-mounted freezer	657	525	597	55%
Compact Refrigerator-Freezers – automatic defrost with bottom-mounted freezer	636	508	581	60%
Average				47%

We assumed the average refrigerator volume was 20.5 cu.ft. for standard sized models and 7.75 cu.ft. for compact sized refrigerators, based on Energy Star documentation<sup>4</sup>.

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>
2. [http://www.energystar.gov/index.cfm?c=refrig.pr\\_crit\\_refrigerators](http://www.energystar.gov/index.cfm?c=refrig.pr_crit_refrigerators)
3. [http://www1.eere.energy.gov/buildings/appliance\\_standards/pdfs/refrig\\_finalrule\\_frnotice.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/refrig_finalrule_frnotice.pdf)
4. [http://www.energystar.gov/ia/partners/prod\\_development/revisions/downloads/refrig/V5.0\\_Spec\\_Framework\\_Document.pdf](http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/refrig/V5.0_Spec_Framework_Document.pdf)

**Table 22. Impact Percentages for Energy Star Dishwashers**

Measure Type	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	Energy Star <sup>2</sup>	EISA 2007 <sup>3</sup> (Effective 1/1/2010)	
Efficiency Metric	EF (cycle/kwh)	EF (cycle/kwh)	EF (cycle/kwh)	
Standard size	0.46	0.66	0.61	28%
Compact size	0.62	0.92	0.83	31%
Average				30%

The new dishwasher standard is based on maximum annual energy consumption (<355kWh/year for standard sizes models and <260kWh for compact sized models). EF is calculated based on the assumption of 215 cycle/year specified in the DOE dishwasher test standard.

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>
2. [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/dishwashers.html](http://www1.eere.energy.gov/buildings/appliance_standards/residential/dishwashers.html)
3. [http://www.energystar.gov/index.cfm?c=dishwash.pr\\_crit\\_dishwashers](http://www.energystar.gov/index.cfm?c=dishwash.pr_crit_dishwashers)

**Table 23. Impact Percentages for Energy Star Freezers**

Measure Type	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	Energy Star <sup>2</sup>	DOE <sup>3</sup> (Effective 1/1/2014)	
Efficiency Metric	Maximum Energy Use (kwh/year)			
Upright Freezers with manual defrost	429	343	389	0%
Upright Freezers with automatic defrost	477	343	389	0%
Chest Freezers and all other Freezers except Compact Freezers	518	415	437	0%
Compact Upright Freezers with manual defrost	542	433	457	48%
Compact Upright Freezers with automatic defrost	615	492	581	49%
Compact Chest Freezers	657	525	597	47%
Average				24%

We assumed the average freezer volume was 20.5 cu.ft. for standard sized models and 7.75 cu.ft. for compact sized refrigerators, based on Energy Star documentation<sup>4</sup>.

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>
2. [http://www.energystar.gov/index.cfm?c=refrig.pr\\_crit\\_refrigerators](http://www.energystar.gov/index.cfm?c=refrig.pr_crit_refrigerators)
3. [http://www1.eere.energy.gov/buildings/appliance\\_standards/pdfs/refrig\\_finalrule\\_frnotice.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/refrig_finalrule_frnotice.pdf)
4. [http://www.energystar.gov/ia/partners/prod\\_development/revisions/downloads/refrig/V5.0\\_Spec\\_Framework\\_Document.pdf](http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/refrig/V5.0_Spec_Framework_Document.pdf)

**Table 24. Impact Percentages for Energy Star Room Air Conditioners**

Measure Type		Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
		DOE <sup>1</sup>	Energy Star <sup>2</sup>	DOE <sup>3</sup> (Effective 6/1/2014)	
Efficiency Metric		EER	EER	EER	
Appliance Type	Louvered Sides				
AC only, < 6000 Btu/hr	N	9	9.9	10	0%
	Y	9.7	10.7	11	0%
AC only, 6000 to 7999 Btu/hr	N	9	9.9	10	0%
	Y	9.7	10.7	11	0%
AC only, 8000 to 13999 Btu/hr	N	8.5	9.4	9.55	0%
	Y	9.8	10.8	10.9	0%
AC only, 14000 to 19999 Btu/hr	N	8.5	9.4	9.3	11%
	Y	9.7	10.7	10.7	0%
AC only, >20000 Btu/hr	N	8.5	9.4	9.4	0%
	Y	8.5	9.4	9.2	22%
Heat pump, < 14000 Btu/hr	N	8.5	9.4	9.3	100%
Heat pump, >=14000 Btu/hr	N	8	8.8	8.7	100%
Heat pump, <20000 Btu/hr	Y	9	9.9	9.8	11%
Heat pump, >=20000 Btu/hr	Y	8.5	9.4	9.3	11%
Casement Only	-	8.7	9.6	8.7	11%
Casement Slider	-	9.5	10.5	9.5	11%
Average					17%

The overall C&S impact is calculated by averaging impacts to all product categories.

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>
2. [http://www.energystar.gov/index.cfm?c=roomac.pr\\_crit\\_room\\_ac](http://www.energystar.gov/index.cfm?c=roomac.pr_crit_room_ac)
3. [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/room\\_ac.html](http://www1.eere.energy.gov/buildings/appliance_standards/residential/room_ac.html)

**Table 25. Impact Percentages for Energy Star Clothes Washer**

Measure Type	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	Energy Star <sup>2</sup>	EISA 2007 <sup>3</sup> (Effective 1/1/2011)	
Efficiency Metric	MEF (cycles/kWh)			
Top-loading compact clothes washer	0.65	-	No change	100%
Top-loading standard clothes washer	1.26	2	No change	100%
Front loading clothes washer	1.26	2	No change	100%
Average				100%

EISA 2007 only added water efficiency requirements for top-loading standard clothes washer and front load clothes washers.

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>
2. [http://www.energystar.gov/index.cfm?c=clotheswash.pr\\_crit\\_clothes\\_washers](http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers)
3. [http://www1.eere.energy.gov/buildings/appliance\\_standards/pdfs/74fr12058.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/74fr12058.pdf)

**Table 26. Impact Percentages for Energy Star TV**

Measure Type	Effective Standard in 2007	Measure Efficiency	New Standard 1	% Impact	New Standard 2	% Impact
	MICS <sup>1</sup>	Energy Star <sup>2</sup>	Title 20 <sup>3</sup> (Effective 1/1/2011)		Title 20 <sup>3</sup> (Effective 1/1/2013)	
Power consumption - on mode (Watt)	133	95	215		134.8	
Power consumption - off mode (Watt)	1.40	0.998	1		1	
Annual power consumption (kWh/year)	381	272	609	100%	384	100%

Based on Energy Star database, an average TV screen area was estimated to be 915 sq. ft. and was used to calculate power consumptions under the new Title 20 standards. On average, TVs are assumed to be on for 2803 hours and to be off for 5957 hours per year. Data in the above table indicates on average, TVs in the market already meet the new Title 20 standards, therefore, the new standards have no impact to the measure.

Data sources:

1. PG&E residential electric measure MICS
2. [http://www.energystar.gov/index.cfm?c=tv\\_vcr.pr\\_crit\\_tv\\_vcr](http://www.energystar.gov/index.cfm?c=tv_vcr.pr_crit_tv_vcr)
3. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>



**Table 27. Impact Percentages for High Efficiency AC Measures**

Measure Type	Effective Standard in 2007	Measure Efficiency		New Standard	% Impact
	DOE <sup>1</sup>	MICS <sup>2</sup>		DOE <sup>3</sup> (Effective 1/1/2015)	
Efficiency Metric	SEER	SEER	Energy Savings (kWh/year)	SEER	
Rooftop or split system SEER 15	13	15	147	14	46%
Rooftop or split system SEER 18	13	18	204	14	61%
Residential HVAC for Hot-Dry Climates	13	-	126	14	37%
Evaporative Cooling (Swamp Cooler)	13	-	419	14	81%
Indirect Evaporative Cooling e.g., Coolerado	13	-	284	14	72%
Ductless Air Conditioning including VRF & Split Systems	13	-	113	14	30%
Residential Water-Cooled Heat Exchangers for HVAC Equipment	13	-	70	14	0%
Packaged A/C (>=65k 12 EER)	13	15	-	14	46%

Based on the annual energy savings for the SEER 15 AC, annual energy savings for a model with SEER 14 (new standard efficiency) is estimated to be 79 kWh/year. Energy savings under the new standard will be reduced by this amount. C&S impacts were calculated by comparing the reduced annual savings to the original measure savings.

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

2. Annual energy savings were from single family savings provided in the PG&E residential electric measure MICS. Annual savings for multi-family homes and for homes in other IOU service territories are expected to be different. However, the percentage impact by the standard update is assumed to be the same.

3. [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cacurn\\_dfr\\_confirmation.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cacurn_dfr_confirmation.pdf)

**Table 28. Impact Percentages for CFL/LED Measures**

		Measure Efficiency	New Standard 1	% Impact	New Standard 2	% Impact	New Standard 3	% Impact
			Title 201 (Effective 1/1/2008)		EISA 2007/Title 201 (Effective 1/1/2011 – 1/1/2013)		Title 201 (Effective 1/1/2018)	
Measure lamp type	Baseline lamp type	Watts	Watts		Watts		Watts	
LED Lighting 40W Equiv - Indoor	40W Incandescent	7	38	94%	29	67%	7	0%
CFL: ≤7W Screw-In Indoor	40W Incandescent	7	38	94%	29	67%	7	0%
LED Lighting 60W Equiv - Indoor	60W Incandescent	13	57	94%	43	64%	13	0%
CFL: 13W Screw-In Indoor	60W Incandescent	13	57	94%	43	64%	13	0%
CFL: 18W Screw-In Indoor	75W Incandescent	18	71	93%	53	61%	18	0%
CFL: 23W Screw-In Indoor	100W Incandescent	23	95	94%	72	64%	23	0%
CFL: >25W Screw-In Indoor	≥120W Incandescent	25	120	100%	72	49%	25	0%
CFL Fixture	Assumed to be the same as the CFL: 23W Screw-In Indoor measure based on MICS							

The about impacts only apply to measures targeting general service incandescent lamps. While annual lamp energy consumptions depend on lamp wattage and annual, C&S impact percentages only depend on lamp wattages. Therefore, the C&S impact percentages in the above table are applicable to measures targeting single family, multi-family, and nonresidential buildings and indoor and outdoor applications.

Data Sources: <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

**Table 29. Impact Percentages for Central Furnace Measures**

	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	MICS	DOE <sup>2</sup> (Effective 5/1//2013)	
Efficiency Metric	AFUE	AFUE	AFUE	
High Efficiency Furnace	78%	92%	80%	84%

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

2. [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cacurn\\_dfr\\_confirmation.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cacurn_dfr_confirmation.pdf)

**Table 30. Impact Percentages for High Efficiency Space Heating Boiler Measures (Residential)**

	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	MICS	DOE <sup>1</sup> (Effective 9/1/2011)	
Efficiency Metric	AFUE	AFUE	AFUE	
High Efficiency Space Heating Boiler	80%	90%	82%	22%

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

**Table 31. Impact Percentages for the Residential Water Heater Measure**

	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE1	MICS	DOE <sup>2</sup> (Effective 4/16/2015)	
Efficiency Metric	EF	EF	EF	
High Efficiency Water Heater	0.594	0.67	0.615	70%

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

2. [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/htgp\\_finalrule\\_fedreg.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/htgp_finalrule_fedreg.pdf)

**Table 32. Impact Percentages for the Pool Heater Measure**

Measure Type	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE <sup>1</sup>	MICS	DOE <sup>2</sup> (Effective 4/15/2013)	
Efficiency Metric	Thermal Efficiency			
Pool Heater	78%	84%	82%	32%

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>
2. [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/htgp\\_finalrule\\_fedreg.pdf](http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/htgp_finalrule_fedreg.pdf)

**Table 33. Impact Percentages for T12 Fluorescent Lamps**

Year	2012	2013	2014	2015	2016	Beyond 2016
T12 to T8 - 4ft	100%	0%	0%	0%	0%	0%
T12 to T8 - 8ft	100%	0%	0%	0%	0%	0%
Linear fluorescent delamping - 4ft	100%	100%	75%	50%	25%	0%
Linear fluorescent delamping - 8ft	100%	100%	75%	50%	25%	0%

Most T12 fluorescent lamps will not be able to meet the new DOE fluorescent lamp standards, which will take effect on July 14, 2012; however T8s will meet those standards. IOUs will no longer be able to claim savings from retrofitting T12s with T8s as T8s will effectively become the new baseline.<sup>5</sup> However, we assume there is still an installed base of T12s in the commercial market eligible for delamping initiatives. Since new T12s can no longer be installed, this existing population will diminish over time. Therefore, we assumed that the new federal standards would diminish the potential for T12 delamping. We assume the installed base of T12s will phase out by 2016.

<sup>5</sup> The standard sets a minimum efficacy which is higher than that of a typical T12, but lower than that of a standard T8. There are very few T12 models that could meet the new efficacy standards and almost all T8s exceed the standard. Since no available models exactly meet the standard, we treat T8s as the new baseline (even though they exceed the standard).

**Table 34. Impact Percentages for Commercial Boilers Measures**

	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	DOE1		DOE <sup>1</sup> (Effective 9/1/2012)	
Efficiency Metric	AFUE	AFUE	AFUE	
Space Heating Boiler 85% Efficient	80%	85%	82%	86%
Space Heating Boiler 95% Efficient	80%	95%	82%	59%

Data sources:

1. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

**Table 35. Impact Percentages for Commercial Refrigerator Measures**

	Effective Standard in 2007	Measure Efficiency	New Standard	% Impact
	MICS <sup>1</sup>	ES <sup>1</sup>	DOE <sup>2</sup> (Effective 1/1/2010)	
Efficiency Metric	Maximum Daily Energy Consumption (kWh/day)			
Refrigerator Glass Doors	9.9	5.5	6.9	32%

Data sources:

1. [http://www.energystar.gov/index.cfm?c=commer\\_refrig.pr\\_crit\\_commercial\\_refrigerators](http://www.energystar.gov/index.cfm?c=commer_refrig.pr_crit_commercial_refrigerators)

2. <http://energy.ca.gov/2010publications/CEC-400-2010-012/CEC-400-2010-012.PDF>

## Appendix M – EERAM Model Algorithm and Input Details

This appendix provides additional detail related to the key inputs and calculations used to measure potential energy savings in the EERAM model. It also addresses additional considerations including the use of avoided costs and the Integrated Energy Policy Report (IEPR).

### *Description of Key Market Potential Modeling Algorithms*

#### **Willingness and Awareness**

It is assumed that willingness and awareness improves over time, up to a maximum limit (set by the model). The year-by-year improvement follows an “S” curve function.

#### **2007 – 2009 Calibration**

The calibration function is used to understand future participation trends for measures that exist in the file of historical utility program achievements. The calibration function is used to identify program participation year by year. The initial calibration factor is determined by actual utility accomplishments and the payback associated with each measure in the calibration year. This initial calibration factor is used each year to estimate program participation; as available stocks and payback changes, participation changes. Program participation by year for measures for which there is no historic data is estimated using Bass Diffusion Curves.

A Bass Diffusion Curve is used to simulate year-by-year program participation. For the diffusion formula a maximum and starting value are needed. The maximum value is represented as the technical potential for the measure. The starting value is a percentage share of the technical potential. This value is a variable that is currently set at 2.5%.

Components making up the calibration function include measure payback by year and the market factor.

Payback is simple payback with the basic calculation for year “n” taking the form:

$$\text{Payback (n)} = (\text{Incremental technology cost} - \text{incentive cost (n)}) / \text{electric bill reduction (n)}$$

The “market factor” is a calibration constant that is computed in the first simulation year to adjust computed participation shares to equal the calibration targets. In the base year, the market factor is calculated using the following form:

$$\text{Market factor} = \text{calibration target} / (\text{total available base technology measures available}) * \text{EXP} (0.0 - \text{Beta Constant} * \text{Measure Payback})$$

Where:

- » The calibration targets for each measure are determined from historic data.
- » The total available base technology measures available is the measure economic potential \* Awareness \* Willingness.
- » The Beta constant represents the average influence of excluded (non-payback) factors.

If scenarios based on changes in incentive levels are initiated, the simple payback by measure is re-calculated for each year after the first year. The first-year value is not changed since we do not want to re-estimate the market factor. Keeping the market factor constant to its base incentive value insures that response to changes in payback can be observed.

Calibration totals were set to the average of 2008 and 2009 results and the market factors by measure were set to 2007 decision factors. The market factors were not set to 2008/2009 because the distribution of calibration targets by measure is influenced by the market factor. Using the same year creates a circular reference error.

The Standard Program Tracking Database (SPTdb)-based calibration targets are at the DEER measure category level and multiple measures make up each DEER measure category. The parsing among the measures within each DEER measure category is a weighted share of first-year maximum market potential by measure. Maximum market potential is economic potential multiplied by the willingness and awareness variables.

The decision to calibrate to the 2006-2008 evaluation results is based on the observation that the gap between reported and evaluated savings has been increasing since 2002<sup>6</sup> as shown in Table 36. Basing the study on the 2006-2008 evaluation results would provide a means to establish goals that are reflective of recent portfolio performance and are relevant to the current market for energy efficiency services.

**Table 36. Post-2002 Reported and Evaluated Net Savings as a Percentage of Savings Goals**

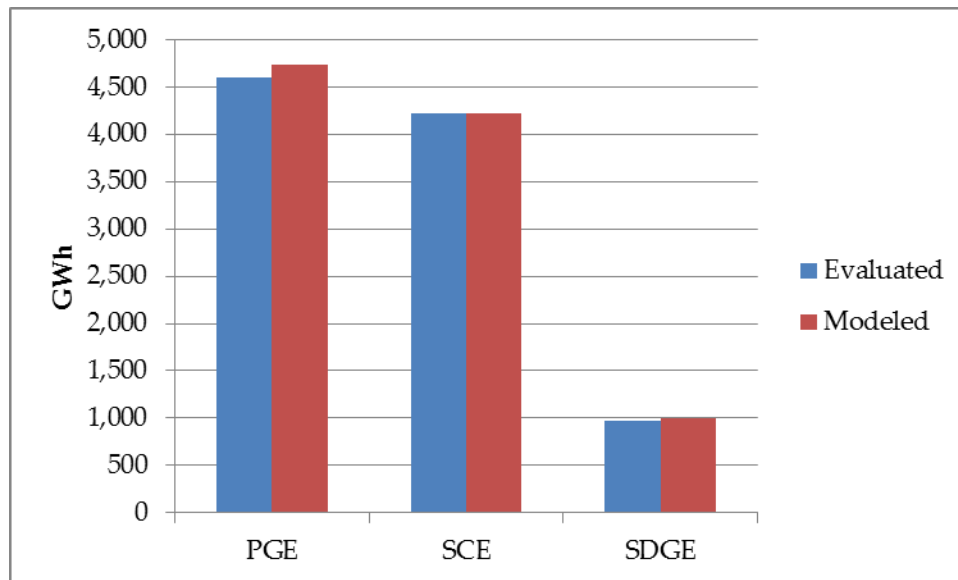
Program Cycle	kWh		kW		Therms	
	Reported	Evaluated	Reported	Evaluated	Reported	Evaluated
2002-2003	118%	104%	104%	86%	98%	81%
2004-2005	127%	79%	133%	75%	182%	55%
2006-2008	151%	72%	122%	64%	117%	66%

Figure 2 presents a comparison of evaluated energy savings vs modeled (calibrated) incremental market potential from 2006 through 2009.

<sup>6</sup> DRAFT 2006-2008 Energy Efficiency Evaluation Report, Prepared by Energy Division, April 15, 2010.

“The goals for the last two programs cycles (2004-2005 and 2006-2008), were developed from analyses conducted in 2002 to 2004. As a result, there are inconsistencies between the savings estimates from the most recent evaluation results and the assumptions and data underlying the original energy efficiency forecasts used to support the CPUC’s efficiency goals. New information on energy efficiency market penetration, end-user adoption rates, and per unit savings levels developed through evaluations and other research conducted since the original goals were developed and this information should inform future updates to the goals.”

**Figure 2. Comparison of Evaluated and Modeled Electric Savings (GWh) 2006 - 2009**



#### **Additions (Future Market Participants)**

Two methods are used to forecast future participation. The first is for measures currently in a utility program portfolio. The second is for both emerging technologies and measures not currently in a utility program portfolio.

For measures where calibration can occur, the market factors developed in the calibration process are utilized. The decision adoption algorithm simulates consumer choice based on simple measure payback and other decision components. For each measure by year, the algorithm estimates the number of units implemented. The algorithm has the following form:

**Number of measures implemented** = total available measure units \* binary logic function \* market factor \* decision maker measure awareness and willingness to install the measure.

The “total available measure units” is a variable that changes with each forecast year and is different depending if the measure is considered a replace on burnout or a retrofit. For retrofit measures, the calculation has the form:

**Total available measure units** = Available building stock \* (maximum density for the competing technologies – base year efficient technology density) – running sum of previous years of efficient technology units installed.

For replace-on-burnout measures, the calculation has the form:

**Total available measure units** = Available building stock / measure life \* (maximum density for the competing technologies – base year efficient technology density) – running sum of previous years of efficient technology units installed.

The “binary logit function” identifies the share of the efficiency measures implemented each year. The logit function has the form:

**Share of Efficiency Measures Implemented** =  $\text{Exp} (0.0 - \text{Beta Constant} * \text{Measure Payback})$



Where:

- » The Beta constant represents the average influence of all excluded (non-payback) factors.
- » The Beta constant is allowed to be modified at the end-use level (within bounds):
  - Larger number representing influences that speed up adoption
  - Lower number representing influences slowing down adoption (such as a recession)
- » Measure payback is simple measure payback and is calculated for each measure, each forecast year.

The market factor helps determine year-by-year measure implementation. The willingness and awareness value limits participation to only those who are aware of the measure and also willing to install the measure. This value changes from year to year.

For emerging technologies and for existing technologies that initially don't pass the TRC screen but later do, a Bass Diffusion Curve is used to simulate year-by-year program participation. The Bass diffusion model was developed by Frank Bass and describes the process of how new products get adopted as an interaction between users and potential users. It has been described as one of the most famous empirical generalizations in marketing. The model is widely used in forecasting, especially product forecasting and technology forecasting. It takes the form:

$$\text{Measure Adoptions (t)} = (p + q * (X(t-1) / m)) * (m - X(t-1))$$

where:

- »  $t$  = time
- »  $p$  = The coefficient  $p$  is called the coefficient of innovation, external influence or advertising effect.
- »  $q$  = The coefficient  $q$  is called the coefficient of imitation, internal influence or word-of-mouth effect.
- »  $X(t-1)$  = Cumulative adoptions up to time " $t$ "
- »  $m$  = the number of potential adopters

For newer technologies, (regardless of type), the average value of  $p$  has been found to be 0.03, and is often less than 0.01. The average value of  $q$  has been found to be 0.38, with a typical range between 0.3 and 0.5. The value for " $m$ " is calculated to be the measure's technical potential. The initial value for " $X(t-1)$ " is a share of the measure's technical potential. This value is set as a variable by measure with the current value set at 2.5%.

At times of any significant change in the payback values, participation may radically change. If it is desired, these radical transitions can be smoothed. The smoothing is an average of the previous year's participation and the current year's participation. Determination of the weighting placed on the previous year's participation is through the smoothing variable. The smoothing function takes place in the "Smooth" module.

## Incremental Market Potential

Incremental market potential by measure is calculated in the "New Participants" Node. The calculation takes the form:

$$\text{Incremental First Time Energy Potential} = \text{Participant common units} * \text{Energy impact/unit} * \text{Net-to-gross}$$

## Measure Re-Engagement Adjustment

Adjustments caused by measures reaching the end of their measure life are calculated in the Reparticipation Module. Measures accrue savings, as determined at the time of their initial participation, through the end of their measure life. At the end of measure life, a certain percentage of these original participants are assumed to participate again, with the remaining balance returning to the stock considered to be base measures. Those who re-engage accrue savings at whatever the current applicable measure impact level is. The cumulative potential is reduced by the increment between the impact value at the time of original participation and current year impact value. Incremental savings are unaffected.

The percentage of those considered to be re-engagers is an input value that can range from 0.0% to 100%. This model does not allow this to be a user-defined input.

A portion of the re-engagers also participate again in the utility program. The percentage of those considered to be utility program re-participants is an input value that can range from 0.0% to 100%. This model does not allow this to be a user-defined input.

## Cumulative Market Potential

The model calculates a running summation of cumulative market potential energy savings. The values are a summation of the incremental market potential estimates less adjustments made at the time of measure re-participation.

## Model Inputs

### Overview

The various inputs specific to each measure in EERAM are details in the IOU measure input table. These inputs were developed and documented outside of Analytica in separate stand-alone Measure Input Characterization Sheets. The MICS list sources for each input. The key variables listed in the MICS and found in Analytica are as follows:

- » Fuel Share – This value identifies what portion of the building stock has the proper fuel type for the measure. However, for some measures and building types, the fuel share is built into the density values.
- » Applicability – This value identifies the share of the building stock that each measure can be implemented in. For many measures, this value is 100%. Some measures have applicability directly input based on the user's knowledge of the measure and building application. For mutually exclusive measures, applicability will be split in a later step among the competition group measures, with the weight being each measure's share of individual TRC to the competition group TRC sum. This weighting is re-done each forecast year as TRC values change.
- » Efficiency Measure – The measure name
- » Base Measure – The base technology for the measure

- » Building Type – The building type application of this measure
- » ED Measure Category – The measure grouping used by the CPUC Energy Division
- » Database of Energy-Efficient Resources (DEER) Category – The end-use grouping, as identified by the DEER database
- » Measure Classification – The classification of measures with the identifications being: 1) High Impact Measures (HIM); 2) Secondary Measures - measures included in past utility portfolios, but which provide low levels of energy savings historically; 3) Measures of Interest (MOI) – existing measures that may not have provided high levels of energy savings in the past, but are expected to in the future; 4) Emerging Technology (ET); and 5) Behavior – measures designed to reduce energy use through changes in maintenance and attitudes
- » Units – The common units for the measure such as bulb, refrigerator, and home
- » Base Technology Density – The number of baseline technology common measure units within a building type (residential), per 1,000 sq. ft. of building space (non-residential), or per kWh (industrial).
- » Efficient Technology Density – The number of efficient technology common measure units within a building type (residential), per 1,000 sq. ft. of building space (non-residential), or per kWh (industrial)
- » Total Maximum Density – The total of baseline and efficient technology common measure units within a building type (residential), per 1,000 sq. ft. of building space (non-residential), or per kWh (industrial)
- » Technology Awareness – The share of decision makers who are aware of the efficient technology. Value directly input.
- » Purchase Willingness – Of the decision makers who are aware, the share of decision makers willing to install the efficient technology. Value directly input.
- » Ex Ante Energy Impact (kWh/unit) – The starting 2013 value used in the model if an ex ante analysis is selected in the inputs section
- » Ex Post Energy Impact (kWh/unit) – The starting 2013 value used in the model if an ex post analysis is selected in the inputs section
- » Ex Ante Coincident Summer Peak Watts/kWh Ratio – The starting 2013 value used in the model if an ex ante analysis is selected in the inputs section
- » Ex Post Coincident Summer Peak Watts/kWh Ratio – The starting 2013 value used in the model if an ex post analysis is selected in the inputs section
- » Avoided Cost Index – Different avoided cost streams affect measures depending on the end use affected. Identification of which avoided cost stream to use is provided here.
- » Net-to-Gross Factor Used in the Model – An NTG value based on EM&V is input here.
- » Measure Life – The measure's effective measure life. The percent of the energy impact that occurs during the winter on-peak hours. Value directly input.
- » Base Incentive (\$/unit) – The base year incentive cost per unit

- » Technology Cost (\$/unit) – The increment or total cost of the efficient technology. The value is incremental if the program is replaced on burnout. If the program is a retrofit program, the full cost (labor and incremental technology cost) is applied.
- » Administrative Cost (\$/unit) – Expressed as a cost per unit
- » Fuel Share and Applicability Adjustment – Some measures are limited in their application by the end-use fuel type they apply to and any limitations to installation that may exist caused by building or appliance characteristics. This value is the multiplication of these two limitations with the form applicability fuel share.
- » Decision Type – Identifies the type of program for implementation. Can be retrofit, replace on burnout, behavioral, or new construction.
- » Efficiency Competition Group – Some efficiency measures, such as CFLs and light-emitting diodes (LEDs), can be installed to replace the same base technology (in this example, incandescent lamps). Only one or the other can be installed and to prevent double counting, each group of measures considered mutually exclusive is assigned a unique number code.
- » Net to Gross Factor – EM&V based NTG values
- » Payback Sensitive – A yes or no variable that indicates if the measure payback stock participation algorithm is appropriate for the specific measure. Some measures, such as the Home Energy Report, are not considered to be sensitive to any changes in payback.
- » 2007 Energy Impact (kWh/unit) – The model begins several years in the past when different assumptions on energy impact may have existed. These values are used for the years 2007, 2008, and 2009. Generally, they are values from the 2005 DEER and are designed to best represent what was included in the 2008 Potentials study.
- » 2007 Coincident Summer Peak Watts/kWh Ratio – The model begins several years in the past when different assumptions on energy impact may have existed. These values are used for the years 2007, 2008, and 2009. Generally, they are values from the 2005 DEER and are designed to best represent what was included in the 2008 Potentials study.
- » 2010 Energy Impact (kWh/unit) – The model begins several years in the past when different assumptions on energy impact may have existed. These values are used for the years 2010, 2011, and 2012. Generally, they are values from the 2008 DEER and are designed to best represent what the utilities used in their filings for these three years.
- » 2010 Coincident Summer Peak Watts/kWh Ratio – The model begins several years in the past when different assumptions on energy impact may have existed. These values are used for the years 2010, 2011, and 2012. Generally, they are values from the 2008 DEER and are designed to best represent what the utilities used in their filings for these three years.
- » Learning Rate Code – Technology cost for all measures is not considered static in all cases. Based on a U.S. Department of Energy (DOE) paper,<sup>22</sup> technology costs come down over time at a rate that varies by technology
- » Number of Years Along the Learning Curve – Related to the learning curve code, measures vary as to where they lie on the curve. This variable is an estimate where a specific measure lies on its learning curve.

- » Measure Availability First Year Index – Most measures are considered available for program promotion in the first year (2007) of the forecast. However, some measures are not available until later years (emerging technologies, as an example). This variable indicates the first year of availability.
- » Ex Ante Energy Impact (therms/unit) – The starting 2013 therm impact value used in the model if an ex ante analysis is selected on the input section.
- » Ex Post Energy Impact (therms/unit) – The starting 2013 therm impact value used in the model if an ex post analysis is selected on the input section.
- » 2007 Energy Impact (therms/unit) – The model begins several years in the past when different assumptions on impact may have existed. These therm values are used for the years 2007, 2008, and 2009.
- » 2010 Energy Impact (therms/unit) – The model begins several years in the past when different assumptions on energy impact may have existed. These therm values are used for the years 2010, 2011, and 2012.
- » Gas Interactive Effects Applicability – Many measures have effects on other end uses, such as lighting measures on increased heating load and decreased cooling load. This applicability identifies the appropriate share of the population affected by this interactive effect.
- » Anticipated Impact % Change by End of Forecast – It is anticipated that for some measures, the non-codes and standards affected energy impacts will change over the forecast period. An example is refrigerator recycling, where the energy impact is expected to decrease significantly by the end of the forecast as newer, more efficient refrigerators enter the population of refrigerators to be recycled. This value shows what percentage of the impact is expected to change over time.
- » A/C Interactive Effects Applicability – Many measures have effects on other end uses, such as lighting measures on increased heating load and decreased cooling load. This applicability identifies the appropriate share of the population affected by this interactive effect.
- » A/C Interactive kWh/kWh Effects – For those measures that have cooling load interactive effects, this is the indicator of the amount of the energy interactive effect.
- » A/C Interactive Watt/kWh Effects – For those measures that have cooling load interactive effects, this is the indicator of the amount of the demand interactive effect.
- » Heat Interactive Therm/kWh Effects – For those measures that have heating load interactive effects, this is the indicator of the amount of the heating interactive effect.

### Measure Categorization

All measures modeled in EERAM are categorized by an end-use category (explained above) and by perceived importance of each measure to a utility's overall portfolio. Each measure is categorized into the following categories based on that measure's role and importance in the utility portfolio. From an analytic standpoint, all measures are treated the same in the current model. The categorization pertains more to the availability and quality of data for each measure. For example, there is considerable industry and California-specific data on CFL lighting; however, many secondary measures that make up a small percentage of savings might not have recent studies available to inform the input data.

- » **High-Impact Measures:** Measures with highest savings contributions to a utility's portfolio are designated as HIMs. In the 2006 -2008 evaluation cycles, a measure was classified as a HIM for a particular utility if it accounted for more than 1% of that utility's claimed savings. Altogether, HIMs accounted for approximately 85% of portfolio kWh, kW, and therm savings in the 2006-2008 evaluation cycle. These measures include residential and commercial CFLs and residential refrigerator recycling, among other measures. A complete list of HIMs characterized by this study can be found in Appendices E-H by IOU and sector.
  - While developing measure inputs, special attention was given to measures categorized as HIMs; resources were prioritized such that HIMs were given priority over other measure categories.
- » **Secondary Measures:** These are the measures that are expected to become high-impact measures once the energy savings potential for the current crop of HIMs is exhausted. All industrial and agricultural measures are labeled as secondary measures.
- » **Measures of Interest:** These are measures that are present in the utility portfolio, but are not classified as HIM or secondary measures.
- » **Emerging Technologies:** These are measures that are not included in utility portfolios currently.

#### *Residential and Commercial Measure Characteristic Inputs*

The technology energy savings and technology density inputs were researched through best available secondary data sources. The primary source for energy savings was DEER 2011.

**Ex Ante Per-Unit Savings:** Energy, demand, and gas ex ante per-unit savings were chosen using the following priority list:

1. Energy Division (ED) vetted 2010-2012 work papers
2. 2010–2012 work papers not vetted by the ED
3. Ex Ante Values used in 2006–08 (cross-checked with SPTdb)
4. ASSET input values
5. Navigant calculations and secondary research

In the commercial sector, if per-unit savings varied by building type, they were weighted to get a sector-wide average value. Details of this process are presented in Appendix D.

**Ex Post Per-Unit Savings:** Energy, demand, and gas ex ante per-unit savings were chosen using the following priority list:

1. DEER 2011
2. CPUC 2006 -2008 Evaluation Study (cross-checked with SPTdb)
3. Energy Division vetted 2010-2012 work papers
4. 2010 –12 work papers not vetted by the ED
5. ASSET input values
6. Navigant calculations and secondary research

In the commercial sector, if per-unit savings varied by building type, they were weighted to get a sector-wide average value. Details of this process are presented in Appendix D.

**Measure Densities:** Measure densities (defined in Table 39) for residential measures were obtained from the Residential Appliance Saturation Survey (RASS)<sup>7</sup>; if RASS did not have the density for a particular measure, ASSET densities were used. For the commercial sector, ASSET densities were used for all measures. ASSET densities represent baseline and energy-efficient measure density levels as of 2007. For these measures, density was adjusted using actual program participation through 2011. Energy Division's Standard Program Tracking Database was used to adjust these 2007 vintage densities.

While using RASS to obtain measure densities, care was taken to develop the densities from actual survey responses. This provided the team with the most detailed data, hence avoiding the possibility of misinterpreting aggregated data. To get fuel-specific appliance densities, appliance density obtained from RASS was multiplied with saturation of electric or gas end-use saturation. For example, this method was used to calculate densities separate for electric and gas-based dishwashers by multiplying total dishwasher density with electric and gas water heating saturation values, respectively.

Commercial densities are represented as units of a technology per thousand square feet. While referencing ASSET to obtain measure densities, care was taken to understand the building type a particular ASSET number applied to. Once this was determined, the density was weighted by building type to obtain a sector-weighted density. Details of this process are explained in Appendix D.

### **Industrial Measure Characteristic Inputs**

The inputs used for the 2008 (ASSET) study<sup>8</sup> for the industrial sector were re-used for this study. The 2008 study used the same outputs as the 2006 study.<sup>9</sup> The inputs to the 2006 study were developed from a literature review of publications; the vintage of these publications ranged from 1985 to 2004, with the average vintage being 1999. The inputs used for the industrial sector were the best available data at the time; this data is in need of an update to capture the change in industrial sector characteristics.

**Table 37. Measure Input Sources for the Industrial Sector**

Study	Author	Vintage
Saving Gigabucks with Negawatts	Public Utilities Fortnightly	1985
Electricity Consumption and the Potential for Electric Energy Savings in the Manufacturing Sector	ACEEE	1994
Learning from Experiences with Industrial Drying Technologies	CADDET	1994
Energy Efficiency in the Metals Fabrication Industries	ACEEE	1995
Energy Efficiency Opportunities in the Solid Wood Industries	Council of Forest Industries.	1996
Information Plastic Processing Industry	Infomil	1996
Energy Efficiency Opportunities in the Solid Wood Industries	Natural Resources Canada	1996
Process Heating in the Low and Medium Temperature Ranges	Centre for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET).	1997
Saving Energy with Efficient Compressed Air Systems.	CADDET	1997
Saving Energy with Daylighting Systems.	CADDET	1997

<sup>7</sup> <http://www.energy.ca.gov/appliances/rass/>

<sup>8</sup> *California Energy Efficiency Potential Study*, ITRON, (2008) ( [www.calmac.org](http://www.calmac.org), CALMAC ID: PGE0264.01).

<sup>9</sup> *California Industrial Existing Construction Energy Efficiency Potential Study*, KEMA (May 2006).



Study	Author	Vintage
Manufacturing Energy Consumption Survey 1994	Energy Information Administration (EIA)	1997
1999 Commercial Buildings Energy Consumption Survey (CBECS) Detailed	EIA	1997
Information for Bread and Bread-and Pastry-Bakeries for energy use in the Environmental Permitting	Infomil	1997
Guide to Energy-Efficiency Opportunities in the Dairy Processing Industry	National Dairy Council of Canada.	1997
1997 Economic Census: Comparative Statistics for California 1987 SIC Basis: Manufacturing	US Census Bureau	1997
Industrial Electric Motor Drive Systems	CADDET	1998
Improving Compressed Air System Performance, a Sourcebook for Industry	LBNL	1998
United States Industrial Electric Motor Systems Market Opportunities Assessment	XENERGY	1998
Improving Pumping System Performance: A Sourcebook for Industry.	LBNL	1999
Energy Cost Reduction in the Pulp and Paper Industry	Paprican	1999
Energy Efficiency in Pumping Systems: Experience and Trends in the Pulp and Paper Industry	ACEEE	1999
Energy Efficiency and Carbon Dioxide Emissions Reduction Opportunities in the U.S. Iron and Steel Sector	LBNL	1999
<i>Steam Digest 2000</i> Prepared for U.S. Department of Energy, Office of Industrial Technologies. Washington, DC.	Alliance to Save Energy	2000
Scenarios for a Clean Energy Future	Interlaboratory Working Group on Energy-Efficiency and Clean Energy Technologies,	2000
Opportunities to Improve Energy Efficiency and Reduce Greenhouse Gas Emissions in the U.S. Pulp and Paper Industry.	LBNL	2000
Emerging Energy-Efficient Industrial Technologies.	LBNL	2000
Profiting from your Pumping System	Tutterow, V., D. Casada and A. McKane.	2000
Energy Use and Energy Intensity of the U.S. Chemical Industry	LBNL	2000
Steam systems in industry: Energy use and energy efficiency improvement potentials	LBNL	2001
Manufacturing Energy Consumption Survey 1998	EIA	2001
Air Solutions Group-Compressed Air Systems Energy Reduction Basics	Ingersoll Rand.	2001
1999 O&M Services Program Impact and Process Evaluation - Final Report	Northeast Utilities System.	2001
Compressed Air Systems in the European Union, Energy, Emissions, Savings Potential and Policy Actions. Germany	Radgen, P. and E. Blaustein (eds.).	2001
Opportunities to Improve Energy Efficiency in the U.S. Pulp and Paper Industry	Proceedings Paper Machine Technology	2001
Motorup Evaluation and Market Assessment	XENERGY	2001
California Industrial Energy Efficiency Market Characterization Study	XENERGY	2001



Study	Author	Vintage
Guidelines for Selecting a Compressed Air System Service Provider and Levels of Analysis of Compressed Air Systems.	Compressed Air Challenge (CAC).	2002
Energy-Efficient Motor Systems: A Handbook on Technology, Program and Policy Opportunities (2nd Edition)	ACEEE	2002
New Construction Program Report on 2000 Measure Installations	RLW	2002
California Statewide Commercial Sector Energy Efficiency S	XENERGY	2002
California's Secret Energy Surplus; The Potential for Energy Efficiency	XENERGY	2002
<i>The Compressed Air Systems Market Assessment and Baseline Study for New England</i>	Aspen Systems.	2003
Energy Efficiency Improvement Opportunities for Cement Making - An ENERGY STAR Guide for Energy and Plant Managers	LBNL	2003
Energy Efficiency Improvement and Cost-Saving Opportunities for Breweries: An ENERGY STAR Guide for Energy and Plant Managers	LBNL	2003
Energy Efficiency Improvement and Cost-Saving Opportunities for the Corn Wet Milling Industry: An ENERGY STAR Guide for Energy and Plant Managers	LBNL	2003
Energy Efficiency Improvement and Cost-Saving Opportunities for the Vehicle Assembly Industry - A Guide for Energy and Plant Managers	LBNL	2003
Guide to Energy Efficiency Opportunities in Canadian Foundries.	Canadian Industry Program for Energy Conservation and Canadian Foundry Association.	2003
Profile of the Chemical Industry in California	LBNL	2004
Improving Process Heating System Performance: A Sourcebook for Industry	DOE	2004
Improving Steam System Performance: A Sourcebook for Industry	DOE	2004
Profile of the Petroleum Refining Industry in California	LBNL	2004

### *Agricultural Measure Characteristic Inputs*

The Potential Goals and Targets (PGT) team, through the 2010–2012 Statewide Agricultural Market Characterization Study & Energy Efficiency Potential (AG), obtained an Excel file that disaggregates the energy use in the agricultural sector in CA into the following discrete segments:

- » Dairies
- » Animal Production/Concentrated Animal Feeding Operations (CAFOs)
- » Refrigerated Warehouses
- » Irrigated Agriculture
- » Greenhouses and Nurseries
- » Vineyards and Wineries
- » Post Harvest Processing
- » Miscellaneous

The PGT team further disaggregated the energy consumed by each segment in the agricultural sector into seven distinct end uses. These end uses are:

- » Water Heating and Cooling
- » HVAC
- » Motors
- » Lighting
- » Refrigeration
- » Process
- » Miscellaneous

This disaggregation of energy consumption of each segment into distinct end uses was done qualitatively using the information available through the literature research conducted and the research plan written by the AG study. Where information on end-use energy consumption for a particular segment was not available, secondary research was conducted. For each segment – end-use combination, the PGT team tried to understand the energy savings potential as a percentage of energy consumed by that segment – end-use combination.

#### Measure Input Characterization Sheets (MICS)

The MICS are a repository of all measure-related inputs for EERAM, for public review purposes. A separate MICS was developed for each unique combination of sector and utility. A complete list of MICS along with the utility, sector, and fuel type developed is presented in Table 38. These MICS are also made publicly available on CPUC's Energy Data Website.<sup>10</sup>

**Table 38. Detailed List of all MICS Developed**

MICS	Utility	Sector	Fuel
PGE Res Elec MICS 20111020 - DRAFT FINAL.xlsx	PG&E	Residential	Electric
PGE Res Gas MICS 20111020 - DRAFT FINAL.xlsx	PG&E	Residential	Gas
PGE Com Elec MICS 20111022 - DRAFT FINAL.xlsx	PG&E	Commercial	Electric
PGE Com Gas MICS 20111021 - DRAFT FINAL.xlsx	PG&E	Commercial	Gas
SDGE Res Elec MICS 20111020 - DRAFT FINAL.xlsx	SDGE	Residential	Electric
SDGE Res Gas MICS 20111020 - DRAFT FINAL.xlsx	SDGE	Residential	Gas
SDGE Com Elec MICS 20111022 - DRAFT FINAL.xlsx	SDGE	Commercial	Electric
SDGE Com Gas MICS 20111021 - DRAFT FINAL.xlsx	SDGE	Commercial	Gas
SCE Res Elec MICS 20111020 - DRAFT FINAL.xlsx	SCE	Residential	Electric
SCG Res Gas MICS 20111020 - DRAFT FINAL.xlsx	SCG	Residential	Gas
PGE Com Elec MICS 20111022 - DRAFT FINAL.xlsx	SCE	Commercial	Electric
SCG Com Gas MICS 20111021 - DRAFT FINAL.xlsx	SCG	Commercial	Gas

<sup>10</sup> <http://www.energydataweb.com/cpuc/home.aspx>

The following lists describe different sections of the MICS and a brief explanation of measure characteristics associated with these sections.

### Input Summary Tab

The input summary tab in the MICS contains the final measure characteristics (in their appropriate format) that are directly input into EERAM. Table 39 presents the various EERAM input criteria contained in the Input Summary Tab, sample data that fulfills that criteria, and the criteria definition.

**Table 39. MICS Input Summary Tab Data and Data Definitions**

<i>EERAM Input Criteria</i>	<i>Sample Data</i>	<i>Criteria Definition</i>
Efficiency Measure	ES Dishwasher	Efficient Technology replacing the existing Baseline Technology
Base Measure	Code Dishwasher	Baseline Technology
Building Type (SFE, MFE, RNC)	SFE	Building Type
ED/Model Measure Group	Dishwasher	Energy Division Measure Classification
DEER Category	Appliance	Mapped measure to corresponding DEER Category
Measure Classification	HIM	HIM - High-impact measure MOI - Measure of Interest Secondary - Non HIM of lower priority ET - Emerging Technology Custom – Site-specific package of measures
Units	Appliance	Units of measure for all inputs (densities, savings, and costs) For Residential, the units for densities are all on a PER HOME basis.
Base Technology Density	0.55	Total number of Baseline units per "average" home.
Efficient Technology Density	0.05	Total number of Energy Efficient units per "average" home.
Total Maximum Density	0.60	Base Technology Density + Efficient Technology Density
Technology Awareness	1.00	Percent of consumers who are aware of this Energy Efficient Technology.
Purchase Willingness	1.00	Percent of consumers who are both aware of this Energy Efficient Technology, and willing to install/implement the technology.
Measure Life	11.00	Effective life of the efficient technology.
Material (& Labor if needed) Cost		Cell calculated within the model that uses the Material Cost for Replace on Burnout (ROB) measures, and Material + Labor Costs for Retrofit (RET) measures.
Decision	ROB	Identifies a measure as being a Replace on Burnout or RET installation.

<i>EERAM Input Criteria</i>	<i>Sample Data</i>	<i>Criteria Definition</i>
Ex Ante Therms/Unit Impact	2.98	Utility claimed energy savings for given technology. (expressed in therms for gas measures)
Ex Post Therms/Unit Impact	1.00	Verified energy savings for given technology. (expressed in therms for gas measures)
Therms/Unit Savings (2007)	3.55	Savings values from ASSET 2008 study.
Therms/Unit Savings (2010)	3.55	Savings values from DEER v2.05
Incremental Material Cost	211.15	Incremental cost between the code baseline technology, and the efficient technology
Labor Cost	115.51	Labor costs of installing the efficient technology.

Presented below is additional explanation of some of the key fields in the Input Summary Tab:

**Ex Ante Per-Unit Savings:** Energy, demand, and gas ex ante per-unit savings were chosen using the following priority list:

1. Energy Division vetted 2010-2012 work papers
2. 2010-2012 work papers not vetted by the ED
3. Ex Ante Values used in 2006-2008 (cross-checked with SPTdb)
4. ASSET input values
5. Navigant calculations and secondary research

In the commercial sector, if per-unit savings varied by building type, they were weighted to get a sector-wide average value. Details of this process are presented in Appendix D.

**Ex Post Per-Unit Savings:** Energy, demand, and gas ex ante per-unit savings were chosen using the following priority list:

2. DEER 2011
2. CPUC 2006-2008 Evaluation Study (cross-checked with SPTdb)
3. Energy Division vetted 2010-2012 work papers
4. 2010-2012 work papers not vetted by the ED
5. ASSET input values
6. Navigant calculations and secondary research

In the commercial sector, if per-unit savings varied by building type, they were weighted to get a sector-wide average value. Details of this process are presented in Appendix D.

**Measure Densities:** Measure densities (defined in Table 39) for residential measures were obtained from the RASS<sup>11</sup>; if RASS did not have the density for a particular measure, ASSET densities were used. For the commercial sector, ASSET densities were used for all measures. ASSET densities represent baseline and

<sup>11</sup> <http://www.energy.ca.gov/appliances/rass/>

energy-efficient measure density levels as of 2007. For these measures, density was adjusted using actual program participation through 2011. ED's SPTdb was used to adjust these 2007 vintage densities.

While using RASS to obtain measure densities, care was taken to develop the densities from actual survey responses. This provided the team with the most detailed data, hence avoiding the possibility of misinterpreting aggregated data. To get fuel-specific appliance densities, appliance density obtained from RASS was multiplied with saturation of electric or gas end-use saturation. For example, this method was used to calculate densities separate for electric and gas-based dishwashers by multiplying total dishwasher density with electric and gas water heating saturation values, respectively.

Commercial densities are represented as units of a technology per thousand square feet. While referencing ASSET to obtain measure densities, care was taken to understand the building type a particular ASSET number applied to. Once this was determined, the density was weighted by building type to obtain a sector-weighted density. Details of this process are explained in Appendix D.

### **Measure Definitions Tab**

The measure definitions tab further expands on measure details presented in the Input Summary tab. The user can refer to this tab to understand the exact baseline and energy-efficient measure specifications.

### **Measure Category Tabs**

Measure category tabs contain details on research done to develop final measure-specific EERAM inputs. All measures included in the analysis were categorized by DEER end-use categories; for measures that did not have a DEER category, one was created (e.g., Food Service). A separate tab was created for each DEER Category. This tab contains documentation and background calculations for all measure-specific fields in the Input Summary tab. All final values are linked to the Input Summary tab for traceability. A list of residential and commercial measure categories is presented in Table 40.

**Table 40. Residential and Commercial Measure Categories**

DEER Category	Sector	Fuel Type
Appliance	Residential	Electric and Gas
Building Envelope	Residential	Electric and Gas
HVAC	Residential	Electric and Gas
Laundry	Residential	Electric and Gas
Water Heating	Residential	Electric and Gas
Whole Building	Residential	Electric and Gas
Indoor Lighting	Residential	Electric
Outdoor Lighting	Residential	Electric
Plug Loads	Residential	Electric
Other	Residential	Electric and Gas
Low Income	Residential	Electric and Gas
Building Envelope	Commercial	Electric and Gas
Food Service	Commercial	Electric and Gas
HVAC	Commercial	Electric and Gas
Indoor Lighting	Commercial	Electric
Laundry	Commercial	Electric and Gas
Exterior Lighting	Commercial	Electric
Plug Load	Commercial	Electric
Water Heating	Commercial	Gas
Other	Commercial	Electric and Gas

### Codes and Standards

All codes and standards changes modeled are presented in this tab. A codes and standards vector was developed for each (applicable) measure. These codes and standards reflected expected change in unit energy savings over time; the base year for all codes and standards vector is 2007. Table 41 presents sample vectors for residential lighting codes and standards changes.

**Table 41. Sample Codes and Standard Vectors for Residential Lighting**

Code and Standard	2009	2010	2011	2012	2013
Energy Independence and Security Act (EISA) Lighting Improvement (100-W-150-W Incandescent equivalent)	1.00	0.94	0.64	0.64	0.64
EISA Lighting Improvement (75-W Incandescent equivalent)	1.00	0.93	0.93	0.61	0.61
EISA Lighting Improvement (40-W & 60-W Incandescent equivalent)	1.00	0.94	0.94	0.94	0.67

The code in standard vector for each year is calculated as follows:

$$\text{Vector Value in Year } n = (\text{UES in Year } n) / (\text{UES in 2007})$$

In the above equation, “UES in Year n” represents UES calculated after taking code and standard changes for that year into account.

### Measure Input Quality Control Tool

The Navigant team developed a quality control (QC) tool for the purpose of understanding the accuracy of measure energy and density characteristics. This tool is a set of columns integrated into the Input Summary tab of each MICS.

Figure 3 shows the workings of a sample QC tool. Each row in the workbook represents a different efficiency measure scenario. Column A provides a description of the efficient technology, while column B provides the baseline. The weighted unit savings for each efficient measure (column E) is the product of the measure’s maximum density and per-unit savings.

**Figure 3. Example of QC Tool Integrated in a MICS Workbook**

	A	B	C	D	E	F	G	H	I	J	K
	Efficiency Measure	Base Measure	Total Maximum Density	Per Unit Savings (kWh)	Weighted Unit Savings (kWh)	End Use	Weighted End Use Energy (kWh)	Savings as % of End Use	Expected Min Savings (%)	Expected Max Savings (%)	QC Check
1											
2	Measure 1	Base 1	0.5367	537.46	288.43	Cooling	2310	12.49%	5%	10%	1.00
3	Measure 2	Base 2	0.5849	264.74	154.86	Cooling	2310	6.70%	5%	10%	0.16
4	Measure 3	Base 3	1.0000	105.28	105.28	Cooling	2310	4.56%	0%	5%	0.41
5	Measure 4	Base 4	0.7703	30.10	23.18	Cooling	2310	1.00%	0%	5%	0.30
6	Measure 5	Base 5	0.7703	250.74	193.14	Cooling	2310	8.36%	5%	10%	0.17
7	Measure 6	Base 6	0.5849	1105.48	646.64	Cooling	2310	27.99%	25%	50%	0.38
8	Measure 7	Base 7	0.1931	121.14	23.40	Cooling	2310	1.01%	0%	5%	0.30
9	Measure 8	Base 8	0.1931	121.71	23.51	Cooling	2310	1.02%	0%	5%	0.30
10	Measure 9	Base 9	1.9660	169.81	333.86	Lighting	4820	6.93%	0.00%	8.00%	0.37
11	Measure 10	Base 10	1.5018	796.67	1196.42	Lighting	4820	24.82%	0.00%	5.00%	4.46

Each measure is paired with the energy end use from which its savings are derived (column F). For example, the energy savings from an evaporative cooler would be assigned to cooling end-use energy, while the energy savings from a building envelope measure would be assigned to the sum of all HVAC energy. Once an energy end use is mapped for each measure, the associated end-use value (kWh or therm) is automatically populated into column G. End-use values are utility specific, and derived from the 2009 California Residential Appliance Saturation Survey (RASS)<sup>12</sup> or the 2006 California Commercial End Use Survey (CEUS), depending on the sector being evaluated.<sup>13</sup>

<sup>12</sup> “2009 California Residential Appliance Saturation Survey”, Volume 2: Results, October 2010.

<sup>13</sup> “California Commercial End Use Survey”, March 2006.

The energy savings for each efficient measure are calculated as a percent of end use (column H) and compared to an expected savings range, which is defined by an expected minimum and expected maximum savings (columns I and J, respectively) as a percentage of measure end use. Expected savings ranges are based on secondary literature research or engineering assumptions.

The last column (column K) determines the degree of variability between the calculated and expected savings. Variability is calculated based on the following relationship:

$$\text{Variability} = \text{Absolute Value} [\text{Calculated Savings} - \text{Avg.}(\text{Max, Min Savings})] / (\text{Max Savings} - \text{Min Savings})$$

Cells are automatically highlighted green, yellow or red based on whether the calculated measure savings values fall inside or outside of the expected range of savings. A green cell denotes that a measure savings falls within the expected range, yellow denotes that the calculated measure savings is at the outside limit of the defined range, while red denotes that a calculated value is outside the expected range of energy savings. A major advantage of basing percent savings on total end-use energy is that the sum of measure-based savings values should not approach or exceed end-use consumption. Out-of-range values may indicate errors in per-unit savings or maximum density.

### **Avoided Costs**

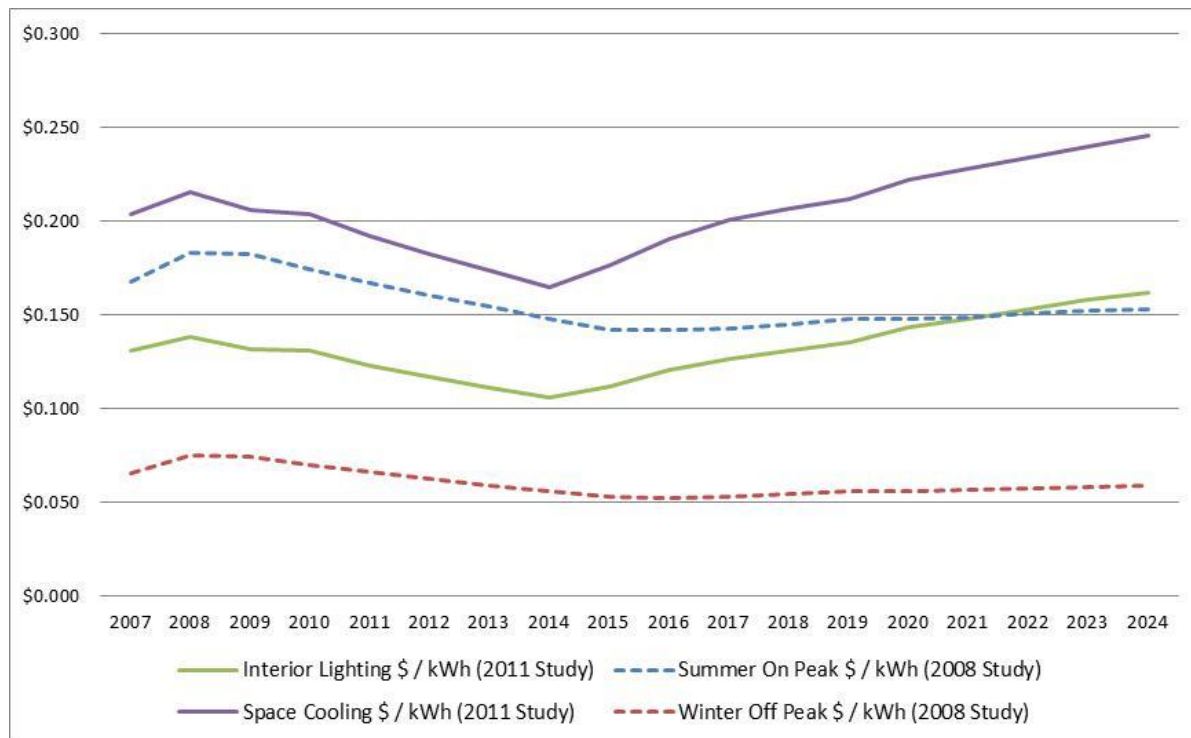
The DEER team developed and provided Navigant with measure-specific avoided costs. The costs were developed with the most current E3 calculator. The avoided cost data is in two forms, depending on the utility, sector, and end use. One is DEER based and the other Time of Use (TOU) load-shape based. Where possible, the DEER-based avoided costs by end use were used. The natural gas avoided costs are expressed in annual \$/therm and one load shape is used.

These avoided costs were used in EERAM. The 2008 study used a weighted utility-wide weighted avoided cost curve.

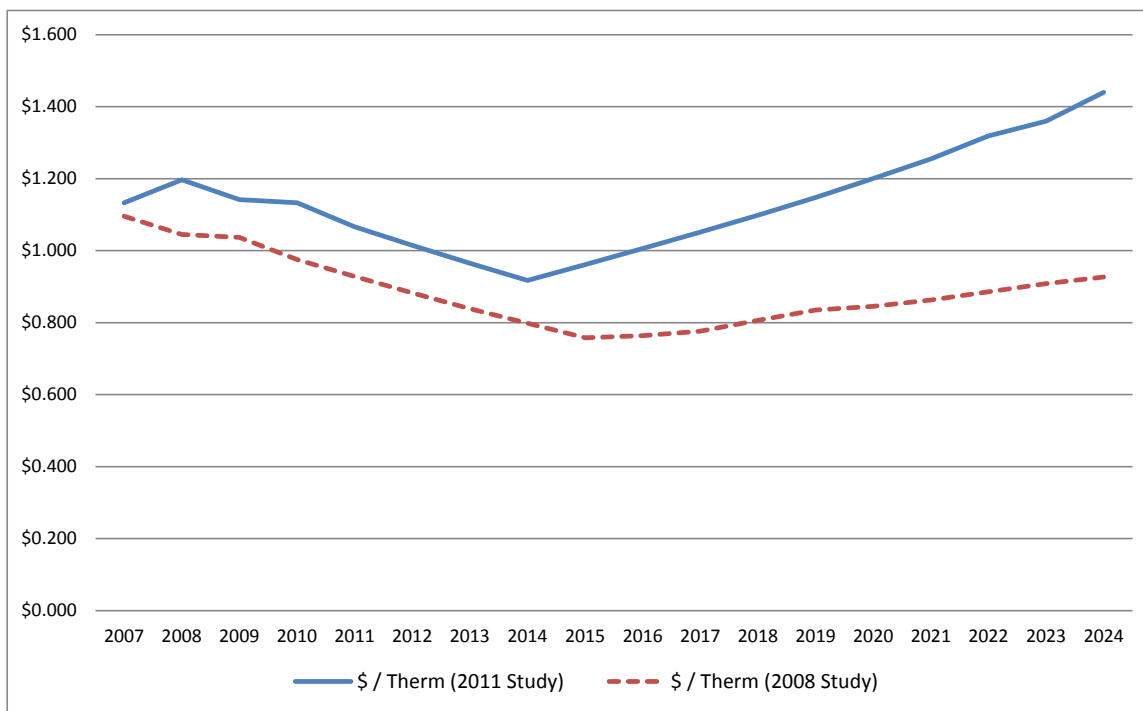
Figure 4 and Figure 5 present comparisons of the avoided costs used in the 2008 study with measure-specific avoided costs used in the 2011 study. Measure-specific avoided costs reduce the possibility of error caused by assumptions made to weight measure-specific avoided cost curves to come up with a utility-wide avoided cost curve.



**Figure 4. Example Comparison of Avoided Energy (kWh) Costs Used in the 2008 and 2011 Studies**



**Figure 5. Example Comparison of Avoided Therm Costs Used in the 2008 and 2011 Studies**



## Use of IEPR

The Integrated Energy Policy Report (IEPR) 2011 being developed by the California Energy Commission is the source for utility rates, energy and demand forecasts, and residential building and commercial sector floor space forecasts utilized in EERAM. This specific IEPR data comes from the CEC's Preliminary California Energy Demand Forecast 2012-2022, which describes the California Energy Commission staff's preliminary forecasts for 2012–2022 electricity consumption, peak, and natural gas demand for each of five major planning areas and for the state as a whole and supports the analysis and recommendations of the Integrated Energy Policy Report 2011. The forecast includes three full scenarios: a high energy demand case, a low energy demand case, and a mid-energy demand case. The high energy demand case incorporates relatively high economic/demographic growth, relatively low electricity and natural gas rates, and relatively low efficiency program and self-generation impacts. The low energy demand case includes lower economic/demographic growth, higher assumed rates, and higher efficiency program and self-generation. EERAM has the ability to use any of these three scenarios.

## Appendix N – EM&V Coordination Matrix

Table 142. 2010-2012 EM&V Studies and Related Potential Model Input Topic Groups

Study Name	Project Number	Measure and Program Impacts	Adoption Effectiveness Assessment	Process Evaluation	Program and Measure Costs	Portfolio Strategy and Management Assessment	Portfolio Impacts	Portfolio Costs	Energy Consumption, Saturation, Market Share			Market Structure and Decision Making				Sector		
									Energy Consumption	Saturation	Market Share	AKA-B Metrics and Measurement	Market Characterization	New/ Enhanced Program Research	Standard Practice Assessment	Res	Commercial	Industrial and Agricultural
Detailed Impact Evaluation of High Impact Measures	1	A																
Impact Evaluation of Custom Measures	2	A																
Impact Evaluation of Strategic Measures	3	A																
Parameter Focused and Cross-Cutting Impact Evaluations	4	A																
Verification and Ex Ante Review/Update Study for Moderate Impact Measures	5	A																
Early EM&V for Non-Residential Custom Projects - ED EM&V Funds	6	A													B,D		A,E	A,E
CFL Laboratory Testing	7	A														A,B,E	A,B,E	
Overarching Process Evaluation of All Residential Programs	8		B	B,D												A,B,E		
ARP Early Feedback Evaluation, Process Evaluation and Market Assessment	10	A	B	B,D	C					B,D	B,D	B,D	B,D		B,D	A,B,E		
Process Evaluation of MFEER and CMHP Programs	13		B	B,D								B,D				A,B,E		
Whole House Process Evaluation and Market Assessment	14	A	B	B,D	C					B,D	B,D	B,D	B,D		B,D	A,B,E		
Moderate Income Direct Install (MIDI) Program Process Evaluation	15	A	B	B,D	C					B,D	B,D	B,D	B,D		B,D	A,B,E		
Overarching Process Evaluation of All Nonresidential Programs	17		B	B,D													B,C,E	B,C,E
Process Evaluation of Sempra's Nonresidential Programs	18			B,D													B,C,E	B,C,E
Process Evaluation of Nonresidential Retrofit Programs	19		B	B,D								B,C	B,C	B,C	B,C		B,C,E	B,C,E

Study Name	Project Number	Measure and Program Impacts	Adoption Effectiveness Assessment	Process Evaluation	Program and Measure Costs	Portfolio Strategy and Management Assessment	Portfolio Impacts	Portfolio Costs	Energy Consumption, Saturation, Market Share			Market Structure and Decision Making				Sector		
									Energy Consumption	Saturation	Market Share	AKA-B Metrics and Measurement	Market Characterization	New/ Enhanced Program Research	Standard Practice Assessment	Res	Commercial	Industrial and Agricultural
Lighting Programs Process Evaluation and Market Characterization	22	A	B,D	B,D	C					B,D	B,D	B,C	B,C	B,C		A,B,E	B,C,E	
HVAC Programs Process Evaluation and Market Characterization	23	A	B,D	B,D	C							B,C	B,C	B,C	B,C	A,B,E	B,C,E	
ME&O Program Process Evaluation	25		B,D	B,D								B,C	B,C					
ETP Process Evaluation and Market Assessment	27	A	B,D	B,D								B,C	B,C					
C&S Market Assessment and Process Evaluation	29	A	B	B,D	C					B,D	B,D		B,C		B,C			
Early EM&V Research for All Programs	30	A	B														B,C,D	B,C,D
Evaluation of PG&E's OPOWER Pilot Program	32	A	B	B												A,B,E		
SCE's Enhanced Inspection Study	33			B												A,B,E	A,B,E	A,B,E
SCE's Catalina Island Program Improvement Assessment	34		B	B												A,B,E	A,B,E	
ACEEE "Big Savers" Best Practices Study	35												B,C	B,C				
Adoption Effectiveness Assessment	37		B													A,B,E	A,B,E	A,B,E
Measure Cost Study	39				C													
Measure Cost Study Data Collection Support	40				C													
Portfolio Strategy and Management Assessment	41					C												
Portfolio Impacts	42						A											
Market Effects and Transformation Research	43						A											
Portfolio and Program Financial Audit & Analysis	44							C										
Macro Consumption Pilot Studies	46								A								B,D,E	
Residential On-Site/Metering Survey	47									B,D						B,D,E		
Residential Appliance Saturation Survey (RASS)	48									B,D						B,D,E		
Industrial Customer Surveys	49									B,D								B,D,E
Industrial End Use Saturation Study (IEUS, pre 2010-2012)	50									B,D								B,D,E
Commercial Saturation Survey	51									B,D							B,D,E	

Study Name	Project Number	Measure and Program Impacts	Adoption Effectiveness Assessment	Process Evaluation	Program and Measure Costs	Portfolio Strategy and Management Assessment	Portfolio Impacts	Portfolio Costs	Energy Consumption, Saturation, Market Share			Market Structure and Decision Making				Sector		
									Energy Consumption	Saturation	Market Share	AKA-B Metrics and Measurement	Market Characterization	New/ Enhanced Program Research	Standard Practice Assessment	Res	Commercial	Industrial and Agricultural
Residential Market Share Tracking	52										B,D					B,D,E		
Commercial Market Share Tracking	53										B,D						B,D,E	
Industrial and Agricultural Market Share Tracking	54										B,D							B,D,E
Overarching Residential Sector Market Assessment	55								A	A,B,D	B,D	D	D	D	D	B,D,E		
Overarching Nonresidential Sector Market Assessment	56								A	A,B,D,E	B,D,E	D	D	D	D		B,D,E	B,D,E
Industrial Sector Market Characterization Study	57								A	A,B,D,E			D					B,D,E
Agricultural Sector Market Characterization	58								A	A,B,D,E			D		D			B,D,E
Building/Facility Renovation/Remodel Rates Study	59												D			B,D,E	B,D,E	B,D,E
Consumer Preference Research to Support Lighting Programs	60											D	D			A,E	A,E	
Measurement and Reporting on AKA-B Metrics	61											D				A,E	A,E	A,E
CEE Energy Star Awareness Survey	62		B									D	D			B,D,E		
Database for Energy Efficiency Resources (DEER)	66																	
Support Ex Ante Development, Review, & Approval (includes non-DEER)	67	A																
Savings Decay and Cumulative Goals Analysis	69	A																
Energy Efficiency Load Forecasting Integration	70	A,C																
Update and Refine Cost-Effectiveness Tools	71	A,C																
T24/T20 and "Reach Codes" Compliance Study	74															A,B,D,E	A,B,D,E	
Strategic Plan Feasibility and Cost-Effectiveness Study	75															B,C,D,E	B,C,D,E	B,C,D,E
Plug Loads Potential Study	76									B,D,E			D			B,D,E	B,D,E	
New Construction Energy Efficiency Potential	77															B,D,E	B,D,E	
Customer Adoption Behavior Study	79											D						